

# **The Austrian Business Cycle Theory:**

## **Validity and Implications**

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Master's Thesis for the Master of Economic Theory and Econometrics Degree

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August 2009

## **Preface**

I would like to thank the people who have had a direct impact on the result of this project. My supervisor Olav Bjerkholt, Professor at the *University of Oslo*, has been of great help by providing me with useful suggestions, constructive critical remarks and friendly encouragement. Sophia Javaid has assisted me by providing important literature in addition to proofreading the text. I am also indebted to Rasmus Bøgh Holmen who has proofread the text. Furthermore, I would like to thank my grandfather, Sven Olav Eid, for his comments and questions regarding methodology. I also thank Ragnar Nymoen, Professor at the University of Oslo, for his interesting thoughts and encouraging comments in response to my questions. This work would not have been the same if it was not for the contribution of these people, but they are of course in no way responsible for mistakes in the text.

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*Tord Kopland Eid, Oslo, 29<sup>th</sup> of August 2009*

## Summary

In this thesis the Austrian business cycle theory is analyzed. Based on the work of Eugen von Böhm-Bawerk (1959[1889]), Knut Wicksell (1962[1898]) and Ludwig von Mises (1953[1912]), the theory was further developed and made famous by Friedrich von Hayek in the 1930s. Arguably, Hayek was the main rival of Keynes during this decade, but after heavy criticism and the publication of the *General Theory* (Keynes, 1936), the Austrian business cycle theory was left with few advocates by the end of World War II. In the recent decades, there has been renewed interest in the theory. This is partly due to Hayek's Nobel Prize in 1974, but even more so because of the strong revival of the Austrian School of economics. Lately, the ongoing economic downturn has led to further interest in the Austrian business cycle theory.

The analysis is conducted with the aim of answering the following three questions:

1. What is the Austrian explanation for, and solution to, the ongoing 2008 financial crisis?
2. What are the policy implications of the Austrian business cycle theory?
3. To what extent can the Austrian business cycle theory be said to be a valid theory?

In order to analyze the theory with these questions in mind, I proceed in the following way. In chapter 2, the history of the Austrian School is presented. This provides a broader understanding of the Austrian business cycle theory and tracks the development of this heterodox school of thought. It is argued that the modern Austrian School follows a “Mengerian” branch of the traditional Austrian School, and that Menger's logical analysis represents an alternative view of economics, compared with the static equilibrium approach of Walras. In chapter 3 the Austrians are further contrasted with the “mainstream” economists. Praxeology – the Austrian method – is analyzed and described as a study of human action with economics as a sub discipline. The Austrian methodology is compared with Milton Friedman (1966[1953]), representing conventional economics. While Friedman argues that the validity of an economic model depends on its ability to predict, the Austrian models aim neither at prediction, nor at description, but are instead utilized as auxiliary constructs for the logical deduction of economic propositions. Austrians rejected that empirical investigations may disprove these propositions.

In chapter 4 a number of microeconomic themes are analyzed and developed into the more macroeconomic building blocks of the business cycle theory. First the most important Austrian equilibrium construct, the *evenly rotating economy*, is presented, before we analyze the role of the entrepreneur. According to the Austrian School, the entrepreneur performs an equilibrating function in his search for profit opportunities. To the extent that the entrepreneur is able to make profits, he is seen as reducing the misallocation of resources. Hence, it is the entrepreneur, based on interpretations of the price signal, who allocates resources between investment and consumption. In the second section of this chapter, the focus is shifted to the capital theory of the Austrian School as this is a hallmark of the business cycle theory. The Hayekian triangle is presented, representing the production structure of the economy. In this way, the capital stock of the economy is divided into stages of production, depending on the time it will take before the capital goods can materialize into consumption goods. The Austrian business cycle theory hinges on this capital theory to a great extent, as it is argued that the capital structure of an economy is highly dependent on the money supply. In the third section, the focus is shifted to interest rates and money. The Austrian theory of interest rates is a subjective theory deduced from the praxeological theory. According to Austrian economics, the single explanation for interest rates is that people have time preferences. Furthermore, the Wicksellian concept of the natural rate of interest is presented. This theory is vital to the Austrian explanation of business cycles. The chapter ends with a review of the market for loanable funds. This classical theory provides the third building block of the model.

In chapter 5, the building blocks from chapter 4 are put together in a consistent figure which allows us to study the Austrian theory of the business cycle. First, a decrease in intertemporal preferences is considered, in order to contrast this case of sustainable growth with the theory of boom and bust. In the subsequent section, the Austrian business cycle is examined and explained from three different points of view. In brief, the argument is that an increase in the supply of money may create a difference between the unobservable natural rate of interest and the market rate of interest which is relied upon by the entrepreneurs. For this reason, entrepreneurs may expand the capital structure of the economy in a way that is at odds with the wishes of the consumers. To the extent that capital goods are specific, these investments are identified as *malinvestments*. When the market rate of interest inevitably converges with the natural rate, it is revealed that these malinvested resources are unprofitable and needs to be reallocated. A costly liquidation process – the recession – must necessarily come about.

In chapter 6 some of the most important critiques against the theory, along with the Austrian explanations, are examined. Among the objections examined is the claim that the Austrian business cycle theory does not take rational expectations into account, the *Cambridge capital controversy* in which Samuelson (1966) rejected the Austrian capital theory because of the reswitching phenomenon and Keynes' critique of the market for loanable funds theory.

In chapter 7 we answer the three introductory questions. First, the theory is investigated in relation to the economic downturn of 2008, by interpretation of some relevant data. Obviously, this is a task that requires an econometric analysis, but this would prove too big a task for a thesis of this format. The empirical analysis must therefore come with a big warning and should not be assigned too much importance, but for what it is worth, the data seems to be consistent with the Austrian business cycle theory. In accordance with this, the main Austrian explanation for the financial crisis is arguably that the central bank of the United States expanded the monetary supply in the years preceding the economic downturn, and caused a business cycle in accordance with the Austrian theory. Furthermore, the Austrian solution to the crisis would be to liquidate the malinvestments by restricting the supply of money. Since the approach chosen by most central banks have been contrary to this, Austrian economists argue that the business cycle has been aggravated and will inevitably hit with increased intensity in the future. The second question is answered with an analysis of the Austrian policy recommendation. The radical Austrian claim is that the central bank is unfit for the task of controlling such an important market signal as the rate of interest, and that it should instead be determined by other factors. At this point there is a dissension among the modern Austrians. While one group supports a banking system based on the 100 % reserve gold standard, other Austrians argue that the fractional reserve system should be kept, but that the central bank needs to be replaced by a free banking system.

The chapter ends with some thoughts on the third question regarding the validity of the theory. Empirically, the present investigation is inadequate to make any bold conclusions, but the data does at least not falsify the theory. Further econometric investigations are necessary in order to answer this more definitely. The logic of the theory seems to some extent promising, and the Austrians are able to provide fairly good answers in response to most of the criticism. However, there are certain problems. The capital theory may be regarded as inadequate, the Keynesian critique of the market for loanable funds is problematic for the Austrian theory, and one may generally be skeptic towards the possibility of deriving true propositions through long chains of logical deductions.

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## 1.0 Introduction – Three Questions Stated

Economics is a complex field. Not only is the discipline constantly influenced by people who have political agendas; economic science is also supposed to be conducted in an environment of ever changing minds of innumerable people. In addition, the economist must always keep an eye on everyone in society, and not solely on a particular group. The economist must not only know the immediate effects of the policy he is suggesting; he must also take into account how his suggestions will affect life and society in the coming decades. Our world today is shaped by the decisions made, and the opinions held, by economists and other intellectuals several decades, and even centuries, ago. In the same way, the society of the distant future will in turn be affected by the current scholars.

This is particularly true in the present situation. Many economists agree that the current economic crisis is the worst since the Great Depression. The Great Depression changed a lot, but in particular, it changed economics. Macroeconomics was crystallized as a field of its own, as the Keynesian revolution swept across the universities. Although it is perhaps unlikely that we will see a similar revolutionary change during the years to come, it is probable that we can expect a lot of new ideas and changes in the way we view macroeconomics. As Gregory Mankiw states, “there is nothing like a crisis to focus the mind” (Mankiw, 2006).

Other phenomena that keep the mind focused are debates and challenging ideas. Questioning the foundations of the subject and the way we study economics will increase our awareness of the strengths and weaknesses of the theories, and assist us in retaining a critical view of our methods and conclusions. In my opinion, one of the most fruitful ways of doing so is through the study of different schools of economic thought.

Dividing economists into schools of thought enables us to distinguish between their opposing methods, their disagreements and how they advice policymakers to act. However, it is important to make explicit that this kind of classification can never be more than an incomplete and partly contradictory generalization, in which some economists will fit almost perfectly into one specific school, while others may be divided between several camps. Furthermore, there may surely be different opinions as to whether a group of economists is distinct enough to be regarded as a school of its own.

Obviously, the schools of thought themselves will vary a lot, depending on how distinguished they are and on the number of economists that can be classified as members of



the school. According to Paul Krugman, "the big dividing line in the profession is salt water versus fresh water. The basic distinction", he said, "is do you think recessions present a problem? And do you think the Government can do something to avert them? The fresh-water people say that recessions either are nothing to worry about or that in any case, the Government can't do anything about them" (Quoted in Kilborne, 1988).

Krugman's distinction between salt and fresh water, refers to the difference between the influential American universities located near the coasts, such as *Harvard*, *MIT*, *Stanford*, *Berkeley*, and *the University of Chicago*, located in Illinois, by the Great Lakes. Despite this distinction, all the mentioned universities may be regarded as "mainstream". What is meant by this is disputable and hard to define, but we can roughly say that the mainstream economists are the ones who influence economic research, teaching and policy making on a broad scale, and they are more or less unified by the fact that they are neo-classical economists.

Continuing with the vague terminology, neoclassical economics is essentially based on a set of assumptions, mainly that 1. People have rational preferences among outcomes that can be identified and associated with a value. 2. Individuals maximize utility and firms maximize profits. 3. People act independently on the basis of full and relevant information. (Weintraub, 1993). This is by no means a complete explanation of what neoclassical economics is, but it is the core of microeconomic assumptions that are shared by most mainstream economists. So while the dissension regarding macroeconomic issues between salt water (Keynesian and New-Keynesian inspired) and fresh water (Monetarism, New Classical/Real Business Cycles) has been rather strong, more or less all mainstream economists share the neo-classical basis.

In the shadow of the mainstream economists and departments, there are some heterodox schools of thought whose approach to economics is at odds with the conventional view. One of these, the Austrian School of economics, claims that the mainstream is on the wrong track regarding many important matters, and that only an acceptance of Austrian theory can remove the flaws. To illustrate the difference between the mainstream and the heterodox Austrian School economists, we can once again refer back to Krugman who states that "the 'Austrian theory' of the business cycle<sup>1</sup>-[is] a theory that I regard as being about as worthy of a serious study as the phlogiston theory of fire." (Krugman, 1998) In spite of this harsh rejection put forward by the most recent winner of the Nobel Prize, studying the

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<sup>1</sup> I will refer to the theory as the Austrian Business Cycle Theory (ABCT) even though such theories in modern time have tended to be tagged as theories of economic fluctuations, rather than of economic cycles.

Austrian Business Cycle <sup>2</sup>Theory (ABCT) is exactly what I am going to do in this text. The aim of this investigation is to give an answer to the following three questions:

1. What is the Austrian explanation for, and solution to, the ongoing 2008 financial crisis?
2. What are the policy implications of the ABCT?
3. To what extent can the ABCT be said to be a valid theory?

At this point, the reader may be in doubt about the relevance of studying the macroeconomic theory of a heterodox school of thought. This may therefore be a convenient time to reveal some of my reasons for having chosen this topic. As social scientists, we are not blessed with the opportunity of observing clear relationships while all other factors are kept constant. In the real world, there are of course continuous changes not only in the minds of the economic actors, but also in nature. Finding truths and certain relationships under such conditions is not an easy task. The history of economics is filled with examples of former truths that have later lost their validity. Because of this, I do not think we can afford to dispose of alternative approaches to the study of economics too easily.

Furthermore, the current economic downturn has reminded us of the complexity of the macro economy, and calls for humility and open mindedness. I do not think there is a better time than the present, when it comes to investigating alternative theories, in search for new ideas and different approaches. In addition, the main macroeconomic theories seem to focus on the labor market or the impact of money, while the real capital of the economy is treated as a homogeneous aggregate stock and termed “K”. The core of the ABCT, by contrast, is the theory of the capital structure. Intuitively, one would think that a capital theory is important in explaining our capital abundant economy. Perhaps more focus on the theory of capital could increase our understanding and remove some of the disputes that are central in the theory of macroeconomics. Indeed, Robert Solow has stated that “One major weakness in the core of macroeconomics is the lack of real coupling between the short-run picture and the long-run picture” (Garrison, 2001:3). With its focus on the trade-off between investment and consumption, the ABCT is potentially useful in filling this gap.

Two notes must be made before we can proceed; one regarding the Austrian School and one regarding business cycles. When it comes to the state of the Austrian School today,

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<sup>2</sup> By using this name I do not intend to downgrade the important role that economists of other countries, such as the British currency school or the Swedish economist Knut Wicksell have played in the development of the theory. However, the name is justified by the fact that it was mainly developed by Austrian economists, and also because the theory is currently advocated by the so-called modern Austrian School.

the current followers regard themselves as a clearly distinct part of economics which is “apart from and above” other economic schools of thought (Rockwell, 1992). By contrast, the mainstream economists have generally a much more negative view of this group of economists, and some do not even characterize Austrian economics as a school of its own. For example, Austrian methodologies have been characterized as “so cranky and idiosyncratic that we can only wonder that they have been taken seriously by anyone” (Blaug, 1980:93). Others have characterized the current Austrian School as a sect (Kling, 2003). Between these extremes, more moderate viewpoints have been raised by non-Austrian economists with some affiliation to the movement. For instance, Milton Friedman said that “there is no Austrian economics – only good economics, and bad economics” (Caplan, 1997), indicating that, while some Austrian economics is good, it should not be regarded as a school of its own. Similarly, the former Austrian Bryan Caplan<sup>3</sup> agreed to this by adding that “Austrians do some good economics, but most good economics is not Austrian” (Caplan, 1997). It is in the spirit of the latter two statements that this thesis is written. Rather than arguing for Austrian economics as a school that can challenge the conventional way of studying economics on all accounts, I intend to investigate how a specific part of Austrian economics, its cycle theory, may contain insights that could improve and challenge modern macroeconomics.

Since this thesis is going to analyze the Austrian business cycle theory, it seems first appropriate to define the phenomenon of the business cycle from an Austrian viewpoint. Contrary to modern terminology, in which business *cycles* to some extent has been identified as business *fluctuations*, Austrians make a distinction between these terms (Rothbard, 2000[1963]:4). Business fluctuations are simply caused by the normal activity in a real economy, in which forecasts regarding life and society are always subject to uncertainty. Thus, business fluctuations occur constantly as the market data – preferences, technology and resources - change. This is explained by general economic theory and is not the particular subject of cycle theory. This is also the case for general movements that take place at different specific time lags. For example, if a natural disaster takes place every 7<sup>th</sup> year, an economic boom preceding the supposed event, as people buy goods in order to protect their lives and property, is not the subject of business cycle theory (Rothbard, 2000:6). Rather, business cycle theory is the study of general movements in business, in the attempt of explaining why

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<sup>3</sup> This may be a good place to explain my use of the term “Austrian”. I will use it here not as a term for people of Austrian nationality, but rather as an indication that the economist I refer to is claiming to adhere to the Austrian School of economics.

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there is a sudden general cluster of business errors. In other words, the problem to be analyzed is how it is possible for a large part of the country's businessmen to fail in their economic predictions, and why these errors all came to be revealed at the same time (Rothbard, 2000:8).

With these remarks in mind, I will proceed with the task. Firstly, I will analyze the history of the Austrian School. Secondly, I will go on to discuss some methodological issues that will help to understand the specific approach of the Austrian School. Thirdly, several foundational microeconomic matters will be presented and discussed as a basis for the Austrian business cycle theory. Fourthly, in the main part of the thesis, I will elaborate the ABCT as it is presented by the contemporary Austrians Roger Garrison (2001) and Jesús Huerta de Soto (2006). Fifthly, I will go through some of the main critiques that have been directed against the theory. In the sixth chapter, I will use the current economic crisis as an empirical case, while trying to investigate to what extent the ABCT can explain the downturn. Lastly, I will turn my focus to the implications of the ABCT, as it is crystallized in the policy recommendations of modern Austrians. I hope to be able to conclude with some interesting findings regarding the validity of the theory by providing answers to the three questions stated above.

## 2.0 Historical Development of the Austrian School of Economics

In this chapter the history of the Austrian school will be examined. The purpose for doing so is not only to provide a background setting for the main task, but also to illustrate how the Austrian School constitutes a distinct approach to the field of economics, compared to the mainstream. In the first section of this chapter we review the original Austrian School from Vienna. In the second section the development of the modern Austrian School is described, with some introductions of the sources that I shall mainly rely upon in the exposition of the Austrian business cycle theory.

### 2.1 *The Austrian School in Vienna*

It is widely recognized that Carl Menger (1840- 1921), professor at the *University of Vienna* from 1873 to 1903, was the founder of the Austrian School. At the same time as Léon Walras and William Stanley Jevons, Menger was responsible for the marginalist revolution which provided economics with new foundations. Firstly, the marginalist revolution ensured that the analysis of economics to a greater extent was based on a micro perspective. This implied the realization of the fact that it is not classes of goods that are exchanged and valued in trade, but always only concrete units of a class of goods (Mises, 2003:163). Secondly, the cost-of-production theories of the classical economists were partly replaced by an increased focus on the demand side of the economy, and marginal utility entered the stage as a new and important theoretical term. Lastly, the importance of mathematics as a tool in the study of economics increased (Sandmo, 2006:146-147). These three main characteristics of the marginalist revolution have prevailed and are still central to the way economics is taught at most universities in the world.

Thus, Austrian economics has been part of the broader neoclassical tradition, and, contrary to for instance Marxism, it is built on the same project of deriving economic laws from the subjective evaluations of economic actors (Boettke, 1996). However, in the years leading up to the Second World War, the Austrian branch largely disappeared as a school of its own, influencing and being influenced by other schools of thought, as the modern science of economics developed.

Jevons, Walras and Menger all grasped the concept of marginal utility, but from the outset, there were important differences between Menger's approach to economics compared with his two marginalist contemporaries. One example of this is that Menger saw values and

preferences as evaluations. By preferring one object to another, objects are ranked on a value scale. By contrast, Jevons equated value with utility or pleasure, measurable in units (Gordon, 1996:5). Thus, a distinction between ordinal and cardinal utility, the latter clearly more convenient for quantitative analysis, can already be seen at this point. Consistently, Jevons and Walras were both of the opinion that economics had to be reformulated by the use of mathematics, and that the ideal for economics had to be physics. Menger, on the other hand, chose a different approach to the field. In his main work, *Principles of Economics* (Menger, 2007[1871]), Menger presents an elegant analysis of goods, prices and exchange. His conclusions are remarkably similar to what can be found in modern textbooks of microeconomics. A notable difference however, is that he restricts himself to a verbal analysis, only aided by a few tables. This refusal to use mathematics in economics has since then been characteristic of the Austrian economists following Menger. As an increasing number of economists throughout the 20<sup>th</sup> century agreed that quantitative measures were necessary to be more specific in the analysis, the relevance of the “Mengerian” approach declined proportionally.

An important factor in order to understand the Austrian School is the explanation for why mathematical tools were dismissed by Menger and his followers. In the Austrians view, the market is a dynamic process of learning and discovery that cannot fruitfully be understood through the use of simultaneous equations (Horwitz, 2000: 18). For Menger therefore, the value of the marginal utility concept was not that it could demonstrate the conditions of equilibrium, but rather that it enabled an analysis of the exchange process itself (Ebeling, 1990: xi). Hence, as we shall emphasize implicitly later in this text, the Austrian approach is not simply a verbal restatement of Walrasian economics, but an inherently different view of the market institution. In the eyes of many Austrian economists, the Walrasian general-equilibrium approach was “timeless and mechanical and thus incapable of producing a theory of the real-world pricing process, i.e., of the actual, and necessary disequilibrium, money prices generated by the historical market process” (Salerno, 1999:36). Menger, on the other hand, wanted to explain prices, not by the use of simultaneous equations, but as a consequence of the fact that “all things are subject to the law of cause and effect” (Menger, 1871[2007]:51). This is what Austrians have attempted to do ever since.

In Vienna, Menger’s influence on his students, in particular Eugen von Böhm-Bawerk (1851- 1914) and Friedrich von Wieser (1851- 1926), ensured the development of what early on was tagged the “Austrian School” (Böhm-Bawerk, 1891). However, Böhm-Bawerk and Wieser never actually studied under Menger, but were inspired by *Principles of Economics*

(Mises, 1969). Up until World War One, the Austrian School was a highly influential school of thought and a part of the economic mainstream. Böhm-Bawerk published his classic *Capital and Interest* (1959[1884,1889,1912]) in three volumes and Wieser introduced the important concept of opportunity cost (Boettke P. & Leeson, P., 2003: 445). In addition, economists such as Philip Wicksteed, Irving Fisher and Frank Knight were all associated with the Austrians. For our purpose, it is particularly important to note that the Austrians and Knut Wicksell (1851-1926) mutually influenced each other following the latter's attendance of Menger's lectures in Vienna in 1887 (Formaini, 2004).

However, according to contemporary Austrians, the unity of the school was already ambiguous at the turn of the century. Out of Menger's two students, Böhm-Bawerk followed more closely in the methodological paths of his master, while Wieser chose a different approach. Wieser claimed that the meaning of economics could be discovered by listening to our own "inner experience". Thus, while Menger focused on the relationship between the individual actor and the external world, Wieser had a more psychological approach to economics (White, 2003:11). This important division was to have a long lasting impact. According to Salerno, Böhm-Bawerk's early death had a very negative impact on the continuation of the Mengerian influence, as Wieser was now left as the most important Austrian economist. Thus, in the first decades of the new century, Wieser was the main influence on the younger Austrians, in particular Joseph Schumpeter (1883- 1950). Schumpeter, who later described Walras as the "greatest of all economists" (Skousen, 2001:215), hardly followed the teachings of Menger and the extent to which he can be regarded as an adherent of the Austrian movement is debated to this day (Kirzner, 1997). Furthermore, Schumpeter also had his own business cycle theory, and for these reasons I have, with one exception, excluded him from the remainder of this exposition. Although Schumpeter left Vienna early, his writings continued to influence the younger generation of Austrians under the guidance of Wieser. Among this later generation were Oskar Morgenstern (1902-76), Gottfried von Haberler (1900-95), Fritz Machlup (1902-83) and the future Nobel Prize winner Friedrich von Hayek (1899-1992).

Thus, as Menger never published the planned follow-up to *Principles of economics*, his influence in the Austrian camp was in decline. However, Böhm-Bawerk had also greatly influenced Ludwig von Mises (1881- 1973), who followed closely in the footsteps of Menger. Mises first appeared with the publication of the *Theory of Money and Credit* (1953[1912]) where he presented the Austrian theory of the business cycle, relying upon the theory of interest by Knut Wicksell, and on Böhm-Bawerk's theory of the capital structure (Garrison,

2001:4). In 1920, he went on to launch the famous debate concerning economic calculation by publishing his article *Economic Calculation in the Socialist Commonwealth* (Mises, 1990[1920]), and two years later the book *Socialism* (Mises, 1951[1922]). His argument was in essence that the resources of a socialist society could not be employed rationally, because market prices- reflecting the relative scarcity of resources- by definition would be prevented from emerging. With *Socialism* and through a private seminar, Mises did have some influence on the younger Austrian economists, such as Hayek, after they had graduated. However, the broader view of economics in Vienna was still shaped by the approach of Wieser and Schumpeter.

After the death of Wieser, the Austrian School in Vienna moved towards its end. In 1930, Hayek was invited to the *London School of Economics* where he held lectures on the Austrian theory of the business cycle. In the lectures that were published as the book *Prices and Production* (Hayek, *Prices and Production*, 2008[1931]), Hayek developed Mises' business-cycle theory in detail and ended up joining the faculty for the next 20 years. According to Salerno, LSE was at this time under the leadership of Lionel Robbins, and the last stronghold of the Mengerian approach. He points out the irony in the fact that "it was under Hayek's influence that economists at the LSE, especially John Hicks, began to introduce Walrasian general-equilibrium theory, as reformulated by Pareto, to Anglo-American economists" (Salerno, 1999:49).

However, when it comes to macroeconomics, Hayek was still influenced by Mises and the Mengerian approach. *Prices and Production* made Hayek famous, and he was to become even more well-known as he went on to challenge John Maynard Keynes' *Treatise on Money* (1930) to which Keynes and his disciples responded (Keynes, 1931) and went on to criticize *Prices and Production* in the *Economic Journal* (Sraffa, 1932). Thus, Hayek was indeed an important, if not the most important, opponent to Keynes in the early 1930's.

When *The General Theory* (Keynes, 1936) was published it was therefore expected that Hayek would react by producing something in return. The fact that this did not happen has puzzled economic historians. Hayek himself wrote that

When it proved that [...] the General Theory conquered most of the professional opinion, and when in the end even some of the colleagues I most respected supported the wholly Keynesian Bretton Woods agreement, I largely withdrew from the debate, since to proclaim my dissent from the near unanimous views of the orthodox phalanx would merely have deprived me of hearing on other matters about which I was more concerned at the time (Hayek, 1976[2007]:11).



Hence, Hayek changed course regarding research interests, analytical procedure and rhetorical style, only to change back after he experienced renewed attention following his Nobel Prize award in 1974 (Salerno, 2008:xxiv). Although Hayek's influence on practical politics increased strongly after this (The British Prime Minister Margaret Thatcher was for instance a strong admirer of his ideas), Hayek and the Austrian business cycle theory cannot be said to have had the same impact on intellectual debates.

Back in Vienna in the 1930s, the uniqueness of the Austrian School seemed to be in decline. Mises wrote that

we usually speak of the Austrian, and the Anglo-American Schools and the School of Lausanne. ...these three schools of thought differ only in their mode of expressing the same fundamental idea and they are divided more by their terminology and by peculiarities of presentation than by the substance of their teachings (Mises, 2003[1933]:228)

Similarly, Hayek later wrote about the Austrian School in the 1930s that “a school has its greatest success when it ceases as such to exist because its leading ideals have become a part of the general dominant teaching. The Vienna school has to a great extent come to enjoy such a success” (Hayek, 1968[1992]:52).

In addition to the watering down of the Austrian School, Nazism was approaching and the remainder of the Austrian School went on to disintegrate completely in the sense that all the main adherents left Austria. Machlup, Haberler, Morgenstern and Mises all went to the United States. However, while the first three ended up in distinguished mainstream institutions such as Princeton and Harvard, Mises was only able to get an unpaid position as a visiting professor at the New York University. Among the reasons for this was that he insisted on sticking to the verbal, Mengerian way of doing economics and also his uncompromising laissez-faire position (Hazlitt, 1984). Thus, while the older Austrian School in many ways was merged with competing schools into the mainstream, this was not the case for that branch of the school which still adhered to the Mengerian tradition; namely the verbal and causal analysis of the market process. However, since this branch to a large extent was upheld by Mises alone, it was at the end of WW II not really possible to speak of an Austrian School any longer.

## 2.2 *The American Austrians*

In New York, Mises launched a private seminar and published his magnum opus, *Human Action* (Mises, 1998[1949]). In this controversial and, at least to Austrians, influential book, Mises “single-handedly recovered and greatly advanced the distinctive Austrian tradition in pure economic theory. Among several other outstanding achievements, Mises explicitly linked up Mengerian value and price theory with an all-encompassing science of human action that he labeled ‘praxeology’” (Salerno, 2002:115). Praxeology is thus the name of the modern Austrian theory of economics and human action, a theory that is constructed by deductive reasoning, based on the starting axiom that *Humans act*, and a few corollaries.

The fact that Mises became an outsider to conventional mainstream economics may seem puzzling due to the quote above in which Mises states that there were essentially no differences between the schools of economic thought. Regarding this, Kirzner explains that Mises’ statement from 1932 referred to the fact that all schools of thought had abandoned the German Historical School which, as we shall see in section 3.1, claimed that there were no absolute economic theories. “Later on,” Kirzner states,

the differences between the schools--Walrasian, Marshallian, Austrian--began to widen. Think of them like three parallel runners who start off close to each other but move progressively further apart as they proceed. By the time I came to study under Mises in 1957, I don't believe he would have subscribed to the view that all schools taught the same thing (Kirzner, 1997).

Because of Mises achievements in New York, he was able to develop a following, and he taught some of the students who were to become the next major figures of the Austrian School, such as Murray Rothbard (1926-95) and the already quoted Israel Kirzner. However, it was still going to take years before one could really speak of an Austrian School after the Second World War.

In 1962 Murray Rothbard published his treatise, *Man, Economy and State* (Rothbard, 2004[1962]) which, according to Salerno (2002:116), can be said to be the revival of the Austrian School. With some exceptions, Rothbard’s books and articles were the only Austrian contributions during the next decade. In 1974 this changed as a conference in the Austrian tradition took place in Vermont where Rothbard, Kirzner and Ludwig Lachmann (1906-90) were holding lectures. It soon became clear however, that the three economists disagreed on a number of fundamental points of economic theory and method (Salerno, 2002:119). Thus, the new Austrian movement was divided, and the division seems, to some extent, to be along the

same lines as the pre-WWII division. While Rothbard claimed that Mises and his approach was the true Austrian one, Kirzner and especially Lachmann had more various influences and were to a larger extent students of Hayek. This caused some dissension in the movement, particularly between Lachmann and Rothbard. In 1977, Rothbard wrote that “I am convinced that Mises would have considered Lachmann (an institutionalist, nihilist, and Keynesian) an ‘anti-economist’, and he would have been right. Lachmann is not an Austrian at all. Back to Mises!” (Quoted in Salerno, 2002:121).

However, the exact opposite of Rothbard’s call took place. Because of Mises’s political and methodological radicalism, the funding sources of the Austrian School decided to support Lachmann at the expense of the Misesian approach. While Kirzner was heading an Austrian Ph.D. program at *New York University*, another pro-Lachmann Ph.D. was launched at *George Mason University* in northern Virginia (Salerno, 2002:122). The Mises-Rothbard approach was still left without any institutional support, but this changed in 1982, as the *Ludwig von Mises Institute* (LvMI) was founded in Auburn, Alabama.

Since 1982, the Austrian School has undoubtedly increased in popularity and fame, and the LvMI has been able to claim a position as the main representative of this school of thought alongside GMU and NYU. Although both adherents to the LvMI and several economists employed at the GMU refer to themselves as Austrians, there is a clear divergence between these institutions regarding their views of Austrian economics (Salerno, 2009). As a simplification, one may say that the economists of GMU see the work of earlier Austrians as a point of departure whose insights may be built quite freely upon. At the LvMI by contrast, the work of the traditional “masters” of the Austrian School are adhered to in a stricter way both in publications and in debates. In this text, we shall not be too concerned with these differences, but rather see the Austrian School as a whole. This is reflected in the work of the contemporary Austrians that are mainly drawn upon in this text; Jesús Huerta de Soto is closely associated with the LvMI and hence closely adhering to Mises and Rothbard. By contrast, Steven Horwitz is an economist of the GMU who, although adhering to the Austrian School, to a larger extent is ready to reform and challenge the conclusions of Mises and Rothbard. Roger Garrison, arguably the preeminent Austrian macroeconomist at present, shall be our main source in the analysis of the ABCT. Garrisons’ work may be viewed as lying somewhere in between what is associated with the LvMI and GMU.

To sum up this historical overview, it is important to point out the difference between the Austrian School of Vienna before the war and the current Austrian School. While the former to a large extent was absorbed and merged with the mainstream, the latter stands in

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stark opposition to this mainstream some decades later. The current Austrian School is thus a school of thought that seems to represent a suppressed branch of the early Austrian School, a branch that seeks to follow the “Mengerian” approach. It is thus problematic to say that the pre- and the post-war Austrian School is an old and a modern version of the same school, as the basis for these schools is quite different and partly contrasting. However, there are also many similarities between the old and the new Austrian School. The business cycle theory is one example of this, as it is perhaps most strongly being associated with Hayek’s work in the 1930’s, but at the same time upheld and developed by the modern Austrians as *the* Austrian theory of the business cycle. Thus, for the purpose of this thesis, the main focus will be on the work of the economists who have contributed in the development of the theory, rather than on the theory of the old or the modern Austrian School per se.

### 3.0 Methodological Foundations of the Austrian School

This chapter deals with some of the methodological peculiarities that distinguish the current Austrian School from the mainstream. I do not have any normative considerations in mind when writing this chapter. Rather than arguing for or against particular methodological aspects, the only aim is to give the reader some sense of the Austrian method, with the hope that this will increase the understanding of how the theory we shall examine later has been developed. Firstly, I shall give a quick review of the methodological debate that shaped the pre-war Austrian School. Secondly, I will present the core of the Austrian method, praxeology, as developed by Mises and Rothbard. Lastly, I shall contrast Austrian methodology with the mainstream, in this case represented by Milton Friedman (1966[1953]).

#### 3.1 “*Methodenstreit*”

To understand the methodological basis of the Austrian School it is useful to return to the past once more. Mises explains that

“People abroad began to refer to these authors as ‘the Austrians’. But the designation ‘Austrian School of economics’ was used only later, when their antagonism to the German Historical School came into the open after the publication, in 1883, of Menger's second book” (Mises, 1969:1).

This antagonism, which is seen as a disagreement over the use of methods in economics, was known as *the Methodenstreit*. This intellectual battle took place between German and Austrian scholars in the decades before and after 1900 and contributed greatly in defining the Austrian economists as a distinct school. However, according to Mises, “the term *Methodenstreit* is, of course, misleading. [...] The matter in dispute was essentially whether there could be such a thing as a science, other than history, dealing with aspects of human action” (Mises, 1969:12).

The German Historical School, reacting to the classical British economists, essentially argued that there are no universal economic laws. In other words, they claimed that economic laws always depend on the historical, sociological and institutional context (Younkins, 2005:35). Thus, according to this doctrine which dominated German universities in the late 1800s, there are no absolutes in economics. For example, adherents to this school of thought would not necessarily refute Ricardo’s theory of comparative advantage, but rather claim that

it is not absolute. In other words, they would claim that there are historical situations in which the effects brought about by free trade or protectionism differ from those described by the “abstract” theory (Mises, 1969:8).

Menger and his followers attacked this position, claiming that the laws of economics do not depend on time and place, but rather that any historical situation is the result of a large number of facts, which cannot prove or disprove any theorem. As stated above, Menger tried to develop this economic theory by the use of deductive reasoning. Thus, the Austrians claimed that a universal economic theory, independent of empiricism, history and experience was the proper way to study economics. As we have seen, this so-called Mengerian, verbal approach lost its influence during the first decades of the 1900s. However, Mises kept on working to establish a complete economic theory based on deductive logic and many contemporary Austrians claim that he succeeded in doing so in his book *Human Action* (1998[1949]). In this work, Mises elaborated praxeology which, in the words of Rothbard, “is the distinctive methodology of Austrian economics” (Rothbard, 1976:19).

### ***3.2 Praxeology – The Austrian Method***

In a sense, understanding the functioning and the constraints of praxeology is the most important factor when it comes to studying the Austrian School of economics. Mises draws a distinction between two sources of knowledge regarding human action: Theory (praxeology) and history. While history consists of unique and complex events, praxeology is the logical and universally true theory of human action. Like mathematics, praxeology is “a theoretical and systematic, not a historical science” (Mises, 1998[1949]:32). It is from praxeology that economic propositions may be derived.

Praxeology starts out from the simple axiom that *humans act* and develops the immediate implications of this fact through logic. Thus, praxeology “deals not with the *content* of men’s values, goals, and actions- not with what they have done or how they have acted or how they should act- but purely with the fact that they *do* have goals and act to attain them” (Rothbard, 1976:30).

According to the modern Austrians, building an economic theory from the logical implications of this axiom, the fact that humans act, is the only way to study economics in a truly scientific way. The theorems of the economic theory developed in this way can never be denied by referring to empirical tests. One must either “unmask logical errors in the chain of

the deductions which produced these results or one must acknowledge their correctness and validity” (Mises, 1998[1949]:67). Only by questioning the correctness of the logic, such as Nozick (1977) does in his critique, can the praxeological facts be proved wrong. Thus, the task of the economist is to search for logical patterns that underlie the actions of all “understanding” individuals (Selgin, 1988:26).

The fact that praxeology starts out from the individual human being implies that Austrian economics is based on *methodological individualism*. According to Rothbard, the fact that human action has a purpose implies that only individuals have ends and can act to attain them. Hence, Austrians believe that economic phenomena are not the expression of some social force of hypostatized entity like “society.” Rather, they are the result of the conduct of individuals engaged in economic activity. The total economic process cannot be understood, therefore, except by analyzing its basic elements, the actions of individuals (Taylor, 1990). However, it must be noted that the concept of methodological individualism does not distinguish Austrian economics from the mainstream, in which the term is also used.

In addition, the praxeological study of human action has another important implication, namely *subjectivism* which stems from Menger. Of course, subjectivism was a hallmark of the marginalist revolution in general, and the concept is, like methodological individualism, far from unfamiliar to mainstream economists. However, the use of subjectivism still contains a telling difference between the mainstream and the Austrian approaches. As White argues,

subjectivism has meant much more than subjective value theory for the Austrians, and especially so for the most recent Austrians. It has marked their approach to every economic question. Subjectivism has been, in short, the distinctive Method of the Austrian School economists. If the Austrians continue to stand apart from mainstream neoclassical economics, the reason lies in their methodological orientation and the implications this has for their theoretical and applied work (White, 2003:3).

Hence, for the Austrian School, the subjective valuation of consumers – *consumer sovereignty* – is implicitly lurking in every proposition, from methodology and theory of value to capital theory and the Austrian business cycle theory.

In order to better grasp the Austrian method, it might be useful to investigate Praxeology through the reasoning that leads to a couple of the main implications of the fundamental action axiom. First, by acting, man shows that means are scarce, because all action aims at removing subjective uneasiness in the broad sense (Rothbard, 2004:5). Second,

action implies that the world is uncertain. If this was not so, humans would have no reason to act, because no action could change a certain outcome (Rothbard, 2004:7). A third fundamental implication is that humans prefer to obtain their goals sooner rather than later. If this was not true, people would constantly delay their actions, waiting for a more preferable time to act. This fact implies the universal principle of time preference (Rothbard, 2004:15). Furthermore, since man always has time preference, “he will strive for the maximum product from given units of factors at each stage of production” (Rothbard, 2004:34). Thus, in general, we can see how the reasoning soon turns into a complex network of propositions regarding human behavior, and ultimately how these are extended into the realm of economics.

In other words, praxeology is not the same as economics. Regarding the difference, Jörg Guido Hülsmann explains that,

Mises believed that economics was only a sub discipline of praxeology dealing with the laws of human action in a system of private property of the means of production. What were these laws of human action that operated only in a private-property system? The characteristic feature of capitalism, Mises held, was that it enabled acting man to base his actions on a profitability calculus. Economic calculation thus produced a good number of phenomena that did not exist in other systems of social organization. To deal with these phenomena was the task of economic science (Hülsmann, 2003:xxiii).

Hence, Mises comes quite close to defining economics. While Praxeology deals with human choices guided by personal value judgments alone, economic science is about human action that is based both on personal value judgments *and* economic calculations (Hülsmann, 2003:xxiv)<sup>4</sup>.

### ***3.3 Realism and A Priorism versus Positivism and Empiricism***

Clearly, there are serious differences between praxeology and the mainstream, positivist, way of studying economics. I will devote this section to investigate in more detail some of these differences. It is hardly straightforward to operationalize this task as, in a wide sense; there may be as many methods as there are economists. To simplify, I will to a large extent restrict

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<sup>4</sup> Lionel Robbins arguably came closer than anyone else to a definition when he (referring to Menger and Mises) stated that “Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses” (Robbins, 1945:31). Robbin’s book is one of the most cited methodological texts in economics and particularly so prior to Friedman (1966[1953]). For our purpose, it is particularly interesting that Robbins explicitly acknowledged his “indebtedness to the works of Professor Ludwig von Mises” (Robbins, 1945:xv-xvi), and went on to cite him a number of times throughout the book.



my attention of the mainstream method to Milton Friedman's paper *The Methodology of Positive Economics* (Friedman, 1966), of which it has been said that "perhaps never in the field of economics has so much been written by so many about so few pages" (Maclean, 1994:125). The fact that this essay has been reviewed time and again should indicate that fast conclusions and bold interpretations are improper. I will nonetheless attempt to use some propositions of this paper as a benchmark, in order to contrast the Austrian methodological views with the ones held by most economists.

Without getting too deeply into philosophical matters, it seems apparent that the differences between the Austrian School's praxeology, and the mainstreams use of empiricism, reflect the profound and ancient philosophical conflict between rationalism and empiricism. While the former appeals to reason as a source of knowledge, the latter claims that knowledge emerges from experience.

In the natural sciences such as chemistry and physics, it is in many cases possible to perform scientific experiments to determine universal propositions and relationships that exist in nature. The precondition is that the natural scientist is able to keep all other relevant factors constant, so that he can be certain that when a variable *A* changes in a specific way, this always has the same effect on some other variable, *B*. Thus, the physician reveals a universal relationship based on experience. In the social sciences however, this method is practically impossible to apply in a satisfactory way. For example, according to the quantity theory of money ( $MV=TP$ ), given that the quantity of money in an economy increases, the prices in the relevant economy will increase as well. However, no economist will ever be able to keep all other variables constant while observing this "experiment". Thus, it is plausible that an increase in the quantity of money could be followed by a reduction in the price level, if a sufficiently large negative shift in demand occurred at the same time.

As we saw in section 2.1, the Austrians who adhered to the Mengerian approach and rejected the use of empirical methods in the study of economics, had a strong, but declining influence on the discipline in the first decades of the 20<sup>th</sup> century. Part of the reason was the increasing influence of the logical positivists of the "Vienna Circle", which emerged during the 1910s. The doctrine of the positivists implied, among other things, that only statements that can be tested have empirical meaning and that all sciences should share a common method (unified science) with physics as the benchmark. Most of the members of the logical positivist movement immigrated to the United States during the 1930s, and had a great influence on post-WWII philosophy in the United States. According to David Gordon, this is one of the main reasons why most American economists rejected praxeology (Gordon, 1996:9).

In this environment, Friedman published his paper on methodology, in which he outlines the means and aims of economics in a way that Austrians strongly object to. Firstly, Friedman disparages the implications of the fact that controlled experiments cannot be conducted in the social sciences. Rather, he maintains that the extent to which controlled experiments are in fact controlled is a matter of degree. Furthermore, Friedman states that “No experiment can be completely controlled, and every experience is partly controlled, in the sense that some disturbing influences are relatively constant in the course of it” (Friedman, 1966:10). In other words, Friedman seems to indicate that empiricism can indeed be useful in economic science.

Mises objected strongly to this view, as he “saw in positivism the same epistemological presumptions that were at work in historicism; namely, a denial of the existence of universal and necessary laws independent of concrete historical events” (Selgin, 1988:2-3). We recall here Mises’ distinction between theory and history. Because human beings change constantly, Mises argued, any empirical observation involving human beings is essentially historical. Thus, an experiment can tell us something about what happened at a specific place during a specific period of time, but it cannot contribute to the universal laws of economic theory. The reason being that economic theory deals with “the regularity in the necessary succession and concatenation of what is commonly called economic events” (Mises, 2003:lxvi). In human sciences, these universal relationships can never be observed or measured. Any empirical situation is necessarily a complex historical event, and no level of sophistication in statistical methods can ultimately alter this fact.

Secondly, Friedman goes on to explain that, contrary to what many seem to believe, the aim of economic models and hypothesis is not to describe reality in a realistic way, but to predict. In his own words,

the relevant question to ask about the "assumptions" of a theory is not whether they are descriptively "realistic," for they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only by seeing whether the theory works, which means whether it yields sufficiently accurate predictions (Friedman 1966: 15).

Thus, when economists make assumptions about the world in their models, they adjust to and accept the fact that the world is too complex to be incorporated in a model. Therefore, this is not what they try to do. Rather, according to Friedman, economists build models and make assumptions in order to make good predictions. Indeed, he states that in order for a hypothesis to be important, i.e. to explain much by little, it has to be descriptively false in its

assumptions. If the hypothesis is successful, this shows that it is able to extract the relevant phenomena from the complex reality (Friedman 1966: 14).<sup>5</sup>

What is the Austrian response to Friedman's statement? According to Roderick Long, Austrians object to the fact that economic models specify factors that are false, rather than leaving them unspecified (Long, 2006:9). For example, when microeconomic models assume full information, something that we know to be false is specified. Because of this, economic models do not simply fail to specify something that is more complex, but even emphasizes something that is wrong (Long, 2006:9).

This indicates that the purpose of models differs. Friedman, on the one hand, accepts empirical testing as a valid way to decide which models are better. Hence, it does not matter that the assumptions are descriptively false, because the data will reveal how important these simplifications are. Austrians, on the other hand, object to the use of empirical tests of the models, because they claim that historical data can never reveal universal theorems regarding humans. Thus, according to Austrians, the positivist doctrine of Friedman seems to achieve neither prediction nor descriptive understanding due to the false assumptions.

At the same time, Rothbard writes that "I do not wish to deny that false assumptions are useful in economic theory, but only when they are used as auxiliary constructs, not as premises from which empirical theories can be deduced" (Rothbard, 1957:315 Footnote). Hence, Rothbard seems to claim that the problem is not the use of false assumptions in the models, but rather what the economist tries to achieve by the use of these models.

This interpretation is confirmed by the fact that there are equilibrium constructs in the Austrian tradition. Although the use of models in Austrian literature, compared to the mainstream, is more limited both in quantity and complexity, this does not mean that they do not play a central role. The most important Austrian general equilibrium construct is arguably the verbal model of the imaginary *evenly rotating economy* (ERE), which we shall examine in the next chapter.

To sum up, neither Austrians nor Friedman aim at making descriptively realistic models. However, the Austrian models mainly serve as tools in order to increase the praxeological understanding of how humans act and economies function. The idea of testing models is rejected on the basis that a test must be based on historical data.

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<sup>5</sup> Let me point out that to some mainstream economists, this disregard of descriptive realism may be seen as quite extreme. Based on Friedman's argument it seems as if a high correlation were to be found between A and B, this would always be seen as a good model, even if the relationship was clearly due to a spurious effect.

## 4.0 Building Blocks of the Austrian Cycle Theory: Microeconomic Answers to Macroeconomic Questions

Although Böhm-Bawerk and Mises produced work in what can be regarded as macroeconomics decades before the Keynesian revolution, Austrians are generally not as eager as other economists to emphasize the distinction between micro and macro. As Steven Horwitz writes: “the reason why macroeconomic problems matter is because they undermine the microeconomic coordination process by disrupting the ability of individual money prices, including the interest rate, to signal actors and facilitate market discovery processes” (Horwitz, 2000:6). Thus, essential to the ABCT are microeconomic phenomena rather than macroeconomic aggregates, the discussion of which will evolve around three central building blocks of the business cycle theory. The presentation of these in the current chapter will to a large extent be based upon Roger Garrisons’ book *Time and Money* (2001). In the first section, we distinguish the market process from the market equilibrium, and emphasize in particular the role of the entrepreneur. In the second section, we look at the theory of capital goods and the model of the capital structure of the economy. In the last section of this chapter, the Austrian explanation for interest rates is presented along with the market for loanable funds and the Wicksellian natural rate of interest. In chapter 5 it will be made clear how the interplay between these phenomena may, according to Austrian economics, cause the boom and the bust of an economy.

### 4.1 The Market Process and the Entrepreneur

One of the main features that distinguish Austrian economics from the mainstream is their focus on the market process rather than on the market equilibrium. On the one hand, traditional economic analysis has to a large extent been based on equilibrium models that depict a world which would only come about under strict assumptions. On the other hand, Austrian economists have always tended to focus on the process by which the market moves towards the equilibrium state. Regarding this, two points are worth noting: First, it is wrong to say that the equilibrium concept is of no use in the Austrian analysis of the market process. Second, according to Austrian economics, it is the entrepreneur who “drives” the market towards equilibrium, and thus determines the location of the economy on the production

possibilities frontier. In this section, I will elaborate these points as the first building block of the ABCT is constructed.

#### 4.1.1 The Equilibrium Concept in Austrian Economics

As was explained in section 3.3, the Austrian equilibrium models are not supposed to yield good predictions or to provide an accurate description of the real world. Rather, these models, of which *the evenly rotating economy* is the most important, are supposed to construct an imaginary state of rest, where it is asked what would happen if market data no longer changed so that the economy could obtain and maintain an equilibrium state. This is done in order to increase our understanding of the ever changing real economy. In the ERE, uncertainty is absent as economic activity continues in the exact same way every day. Thus, there is no misallocation of resources and, therefore, no places for entrepreneurial profit or loss in the model, since factor prices are bid up to their full discounted marginal revenue products (Klein, 2008:14).

The main assumption, that changes in the market data are eliminated implies that the time element no longer matters in the model in the sense that the path to equilibrium is not continuously disrupted as it is in the real economy (Mises, 1998:247). However, this does not mean that the ERE is a model of a stationary economy, but only that no changes occur and that the rate of interest is uniform and constant, corresponding to the invariable time preferences. Because of this, the market prices of all goods and services coincide with the final prices that would come about when all changes had been made and thus all needs were satisfied at every moment, i.e. a final equilibrium. This is the state to which the economy is always tending if all needs, wishes, rates of production, prices and population were to remain constant (Rothbard, 2004:321). There is thus perfect price stability in the model, and the same market transactions are repeated again and again (Mises, 1998:248). In this hypothetical setting then, unstable and irregular changes in the data can be analyzed, but, as Mises is eager to remind us, only if we never forget what purpose the model is designed to serve. The first aim of the ERE is to function as a tool in order to analyze the tendency toward the establishment of the ERE, which is inherent in every action, but that can never come about in a universe of living creatures. Second, we need to understand in which ways the real world is different from that of the imaginary construct. In other words, we need to realize that uncertainty about the future is always present, and that profit and loss are necessary features of acting in such an environment (Mises, 1998:250-251).

So far, it may seem as if the ERE is not too different from the perfect competition model of conventional microeconomics. However, as already noted, it is important to realize that there is a big difference between the use of this Austrian equilibrium concept and the way the phenomenon of equilibrium is used in mainstream models. Mises emphasized that the ERE is only a thought experiment, and that the important thing to analyze is not the actual equilibrium state that the economy infinitely tend towards, but rather the actual process of movement towards this steady state. In Mises view, a mathematical analysis could never surpass a verbal analysis of this kind:

Logical economics [(praxeology)] is essentially a theory of processes and changes. It resorts to the imaginary constructions of changelessness merely for the elucidation of the phenomena of change. But it is different with mathematical economics. Its equations and formula are limited to the description of states of equilibrium and nonacting. [...] The main deficiency of mathematical economics is not the fact that it ignores the temporal sequence, but that it ignores the operation of the market process (Mises, 1998:353).

As should by now be clear, to the extent that Austrian economists use equilibrium constructs, the models are not attempts to predict or describe reality. The models are only tools that formalize the *ceteris paribus* assumption in order to improve the clarity and accuracy of the verbal analysis.

#### **4.1.2 The Role of the Entrepreneur in the Market Process**

In the previous section, it was explained how the equilibrium model of the ERE depicts a situation in which all needs are satisfied and no changes in the market data occurs. In this section we change focus to the source that drives this market process towards the equilibrium state. There are two categories of producers' prices and incomes in the ERE: interest (which stems from time preferences and is uniform throughout the economy), and "wages"- the prices of the services of various labor factors (Rothbard, 2004:509). Thus, in the ERE the equilibrium prices are always adjusted in such a way that there is room for neither profit nor loss. Profit and loss are in other words phenomena of disequilibrium. This equilibrium construct then enables the economist to distinguish between entrepreneurial profit-and-loss and returns brought about by the fact that production takes time. The former stems from misallocated resources (which do not exist in the ERE), and the latter from the fact that people have time-preferences (which would still continue to exist in a world of certainty and equilibrium).

When we shift our focus from the ERE to a real, changing economy, uncertainty is always present, resources (land, labor and capital) will always be misallocated and, hence, the economy will always tend towards, but never reach, the final equilibrium state of the ERE. In the everyday situation of market disequilibrium, there is widespread ignorance as market participants are unaware of the beneficial exchanges that are available to them in the market. There will in other words, for each product, exist opportunities for mutually beneficial exchange among potential buyers and sellers (Kirzner, 1973:69-70). Kirzner claims that “profit opportunities arise when the prices of products on the product markets are not adjusted to the prices of resources on the factor markets” (Kirzner, 1973:85). Hence, since there are discrepancies between the resource allocation and the preferences of the consumers when the market is in disequilibrium, profits can be obtained by discovering and equalizing these imbalances. To the extent that this is being done, the economy will move towards the ERE while the profit opportunities diminish.

To be more specific, the reason why it is possible to make a profit is that resources are misallocated, so that the factor prices are different from the discounted marginal value products (DMVP) of the factors. If the price of a factor is higher than the DMVP of a factor in a specific allocation, this means that the factors can be sold, and thus reallocated in a more profitable way. Contrary, if the price of a factor is lower than the DMVP, the entrepreneur will buy more of the factor and thereby increase the profit by employing it in production. In order to perform his function, the entrepreneur has to be alert and act to neutralize existing discrepancies by using his knowledge and foresight. Furthermore, profit is only made when the rate of return is higher than the rate of interest was in the same period. For example, a return of 2% in a specific period will be regarded as a loss if the rate of interest was 5% during the same period. Hence, it is necessary to operate with discounted profits to determine whether the entrepreneur actually suffered a loss or gained a profit from a project (Rothbard, 2004:512-513).

Having noted that the Austrian focus is on the market disequilibrium process, the next step is to ask what it is that “drives” the market towards the long-run equilibrium. The answer, in the view of Mises, Rothbard and Kirzner, is that it is neither consumers nor the owners of the means of production who serves this function, but rather the profit-seeking entrepreneurs (Mises, 1998:325). In the Austrian view, profits are an index that maladjustments are being met and combated by the entrepreneur (Rothbard, 2004:515). Thus, an entrepreneur, in the theoretical sense, is a person who changes the way resources are allocated in order to satisfy consumer demands more efficiently. This is important for our purpose because, as will be

explained in later sections, the ABCT is in essence a theory of maladjustments and disequilibrium, caused by the entrepreneur's reactions to systematically distorted price signals. Hence, the entrepreneur has a central role to play in the Austrian business cycle theory.

If the entrepreneur instead of making profit were to suffer a loss, this is an indication that his foresight was fallacious, and that he has increased the misallocation of resources, moving the economy further away from the ERE. Hence, when losses are made, the action of the entrepreneur is not equilibrating (Rothbard, 2004:515). An important point, however, is that the entrepreneurs learn from their mistakes and have an interest in avoiding losses. Thus, on average, entrepreneurs make more profits than losses so that the economy in total is moving towards the equilibrium (Kirzner, 1997).

It may seem peculiar that the focus of the market process is directed towards the entrepreneur rather than for example technological innovations. However, the reason is that the entrepreneur is seen as acting in an environment with a set of resources, preferences and technologies. In this environment the entrepreneur stays alert to profitable opportunities, some which may come about as there are technological improvements. In other words, even if new technologies are invented, someone needs to act in order to exhaust the profit opportunities yielded by these new inventions. Hence, it is the entrepreneur who takes action in order to utilize the new technology by reallocating resources accordingly.

When stating the reasons not to include Schumpeter above in this exposition, I noted that there would be one exception: One can hardly talk about entrepreneurship without mentioning Schumpeter's name. In the Schumpeterian view, the entrepreneur is an innovator who finds new ways to do things and new things to do. In this way, the entrepreneur creates a temporary gap between the input and the output prices. This allows the Schumpeterian entrepreneur to obtain profits for some period of time, until imitators begin to take advantage of these new opportunities and the equilibrium is restored (Kirzner, 1973:79). How does his theory relate to the view of Kirzner, Mises and Rothbard? According to Kirzner, there are several similarities. First, the entrepreneur is in both views an alert decision-maker who departs from the routine of repetitive working with widely known opportunities. Second, neither Kirzner nor Schumpeter views the entrepreneur as contributing factor services to production; the value in entrepreneurship is rather the decision to direct inputs into the most profitable processes.

In spite of the agreement on these issues, there are important differences that need to be clarified. As explained above, the entrepreneur is seen by Kirzner as the force that drives



the economy towards equilibrium by reallocating resources to uses that are more suitable to the wishes of the consumers. For Schumpeter, by contrast, the entrepreneur acts to disturb an existing equilibrium situation. Hence, the entrepreneur serves an equilibrating function in the view of Kirzner, while he represents a disequilibrating force in the eyes of Schumpeter. According to Kirzner then, Schumpeter's view "helps promote the quite erroneous belief that entrepreneurship is somehow unnecessary to understanding the way the market tends toward the equilibrium position" (Kirzner, 1973:74-75). Furthermore, Kirzner sees the entrepreneur only partly as an innovator. Rather than introducing new products or new production techniques as Schumpeter maintains, the entrepreneurial task consists mainly of staying alert to cases where resources are undervalued compared to the preferences of the consumers, and then to act upon this knowledge (Kirzner, 1973:81). In Kirzner's own words, "for Schumpeter, entrepreneurship is important primarily in sparking economic development; for me it is important primarily in enabling the market process to work itself out in all contexts-with the possibility of economic development seen merely as a special case" (Kirzner, 1973:81).

#### **4.1.3 The Production Possibilities Frontier: Investment and Consumption**

The production possibilities frontier (PPF) is commonly included in economics textbooks as it provides a convenient illustration of scarcity and trade-offs. As the economy is constrained by resources, technology and preferences, there is of course a limit to the amount of goods that can be produced, and thus a limit to the amount that may be consumed or invested. In our case, the PPF that will be useful depicts the trade-off between the production of either investment goods ( $I$ ) or consumption goods ( $C$ ). This is depicted in figure 1. Since government spending  $G$  and taxes  $T$  are not considered, we assume in this case that the economy is a private one.

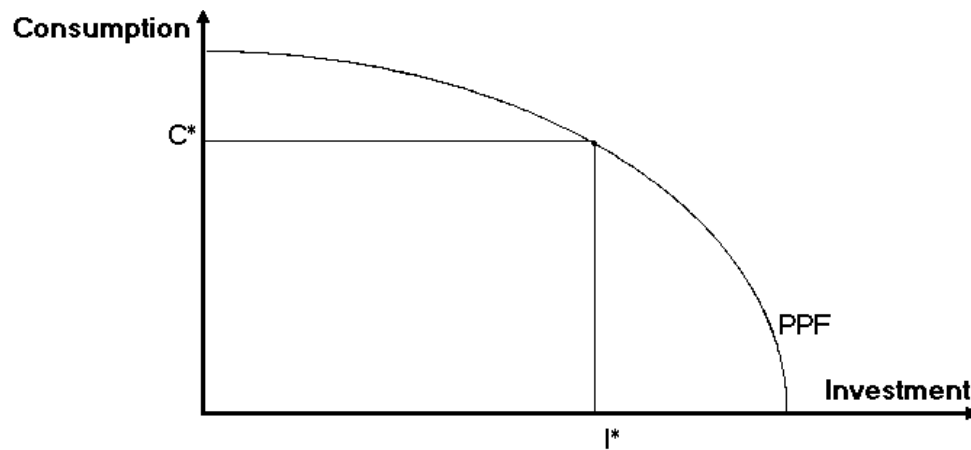


Figure 1: The sustainable production possibilities frontier.

As we have seen in the current section, entrepreneurs, searching for profit, allocate the resources of the economy by responding to the price signals of the market. Thus, given the technologies, resources and preferences of the economy, it is the alert entrepreneurs who change the composition of investment and consumption in the economy.

Investment, in this case, is *gross* investment which is the same as the amount of capital goods that are produced in a given time period (for example a year). This means that  $I$  consists of both investments that are made in order to replace depreciating capital and of new (net) investment. In order for the economy to grow, i.e., in order to expand the PPF and allow increased amounts of both consumption and investment in the future, net investment has to be positive. This is illustrated in the following figure where investment is split between reinvestment and new investment (Garrison, 2001:42-43).

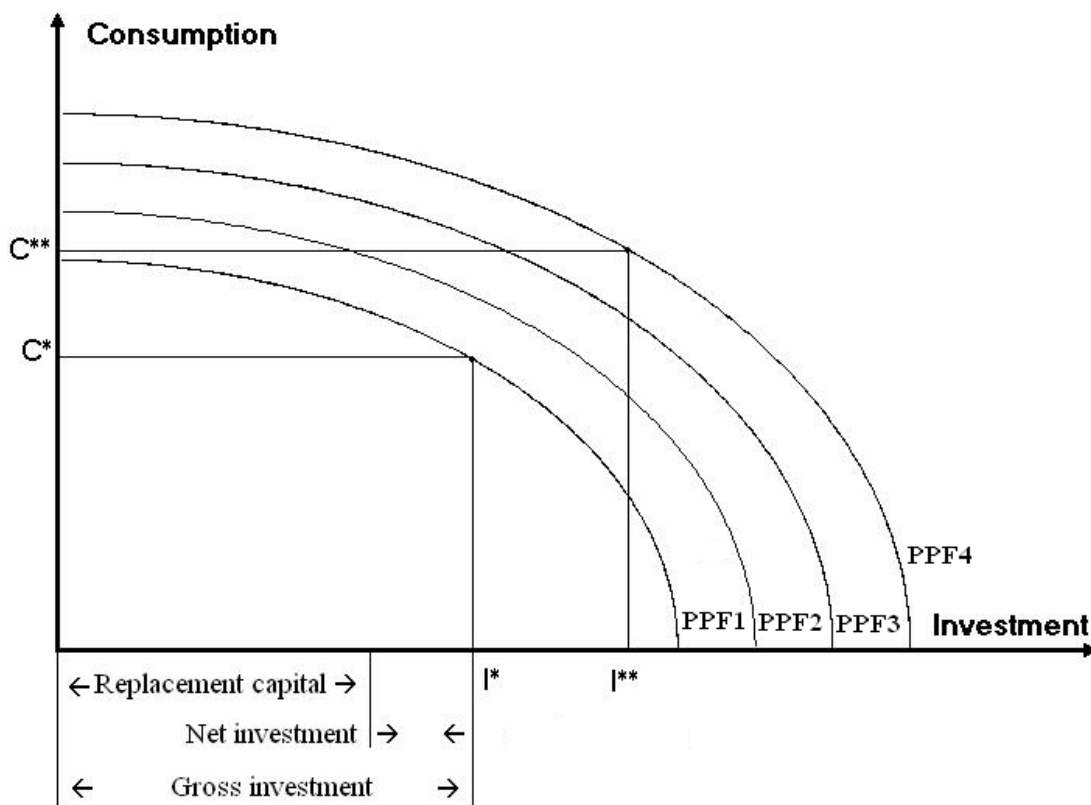


Figure 2: Expanding PPF induced by positive net investment.

As can be seen from figure 2, the positive net investment allows the economy to expand in such a way that both investment and consumption may increase simultaneously to a higher sustainable level. After three periods of net investment, consumption can be increased from  $C^*$  to  $C^{**}$  at the same time as investments expand from  $I^*$  to  $I^{**}$ . This means that the sacrifice of consumption in the present allows more consumption goods to be available in the future.

Before continuing, it is necessary to include some remarks regarding the PPF. Firstly, the economy will not necessarily be located exactly on the PPF. Rather than an example of the real world, this is a theoretical illustration of an economy in which all the resources are put to use. Thus, if there are idle resources, for example a high level of unemployment, the economy will be located in the area inside the PPF. It is then possible to increase both  $I$  and  $C$  at the same time. Secondly, we assume that the PPF is not absolutely binding the other way either, as both consumption and investment may move outside the PPF. This may happen if the level of unemployment falls below the “natural” level associated with full employment, and if the normal maintenance of the capital goods is being skipped. However, this situation is not sustainable and cannot continue for a long period of time (Garrison, 2004: 337 footnote 12). This point shall be essential as we analyze the ABCT.

## 4.2 Capital Goods and Capital Structure

It has already been noted above that the capital theory is the core of the Austrian business cycle theory and one of the main points of departure from mainstream macro. Indeed, capital theory is such an important part of the ABCT that Garrison (2001) has called it “capital-based macro” as opposed to Keynesianism which puts the labor market in the center and Monetarism with its main focus on money. The theory of the capital structure is mainly ascribed to Böhm-Bawerk (1959[1889]), who built on Menger’s (2007[1871]) theory of capital goods. The core of this Mengerian theory will be explained in the first subsection. Subsequently, the theory of the capital structure will be presented in the second subsection.

### 4.2.1 Goods of Higher and Lower Order

Even though praxeology is a term which is mainly associated with Mises, he only aimed at formalizing and expanding the method that many economists had implicitly used in the past. For example, Menger used deductive logic as he aimed at developing a new understanding of economics in *Principles of Economics* (2007[1871]). By doing so, he developed the theory of goods of higher and lower orders. This was to be the backbone of the capital theory of Böhm-Bawerk, and of the capital-based ABCT.

Menger begins his classic book with a theory of the good, which leads him to a distinction between goods of different orders. He states that the satisfaction of a human being depends upon the goods that can be used for direct consumption at any given time (Menger, 2007:56), before he goes on to claim that

in addition to goods that serve our needs directly (and which will, for the sake of brevity, henceforth be called “goods of first order”) we find a large number of other things in our economy that cannot be put in any direct causal connection with the satisfaction of our needs, but which possess goods-character no less certainly than goods of first order (Menger, 2007:56).

Thus, Menger makes a distinction between consumption goods, which he calls *goods of the first order*, and capital goods, which can be of the *second*, *third*, or *higher order* depending on the number of production stages these goods will go through before being consumed. These goods are produced by land, labor and/or other capital goods, but they cannot be consumed directly. There are several important characteristics of goods of the

higher order, i.e. capital goods, that makes them different from goods of the first order, i.e. consumption goods.

First of all, capital goods are only indirectly useful, in the sense that they cannot satisfy human needs themselves, but only produce consumer goods that can do so. If the consumption good, for some reason, were to lose its value, then the capital goods that are designed to produce it will lose value also (Menger, 2007:57). However, a higher order good will not lose all its value, if the demand for only some of the consumer goods it contributed in the production of were to disappear (Menger, 2007:66). More formally we can say that the value of a capital good with a very specific use can more easily disappear than that of a capital good which can be applied in the production of a large variety of consumer goods.

An example may clarify this. Assume that we live in a world without trade and that we had all the ingredients needed to bake a cake. Suppose also that some of the ingredients (higher order goods) could be used *only* to produce the cake (sugar), while other ingredients could be put to use in alternative ways (flour). Assume further that we then decided to live healthier and thus decided to cease baking cakes, i.e. the value of cakes would drop to zero. Immediately, the value of the specific capital good, sugar, would drop to zero as there were no other way to employ it. Flour, on the other hand, would only lose a small part of its value as it could still contribute in the production of other consumer goods that had maintained their value.

Secondly, another characteristic of higher order (capital) goods is that they only contain value if we are also able to use the complementary capital goods of the same order. Because a capital good is useless in satisfying human needs independently, it can only create value by producing consumer goods. This, in turn, can only happen if the capital good of a specific order is combined with a complementary good of the same order, so that a good of a lower order is produced (Menger, 2007:58-59). Hence, “the goods-character of goods of *second* order is dependent upon complementary goods of the same order being available to men with respect to the production of at least one good of first order”. (Menger, 2007:60)

To utilize our example of the cake once more, we still assume that the sugar is a specific good that cannot be traded. Even if we want to bake the cake, the sugar will not be worth anything, unless we also have flour and the other second order goods that are necessary to bake the cake.

A third important characteristic of capital goods is that “*The goods-character of goods of higher order is derived from that of the corresponding goods of lower order*” (Menger, 2007:63). By this general rule, Menger claims that there is no value in controlling even a

whole range of corresponding goods of, say, the third order, unless one is able to obtain the corresponding goods of the second order. In other words, it is useless to have the third order goods necessary to produce a second order good, if it was impossible to obtain the corresponding second order goods that would be necessary in the production of a consumption good.

Once more, we can illustrate this in our example where we assume that sugar is a specific good of the second order that cannot be traded. Given that we control all the goods of the third order that are necessary for the production of sugar (i.e. the seeds for the sugar plants, the machines for harvesting, the buildings for storing etc.), and assuming that these third order goods are specific in the production of sugar, this will be of no value unless we are in possession of all the complementary goods of the second order that are needed in the production of the cake. Given our assumptions, having no flour will render all third order goods useless, as they cannot be directed to the satisfaction of any human need.

#### **4.2.2 The Capital Structure of the Economy**

The central feature of the ABCT is the theory of the capital structure of production. According to Garrison, the central place of the intertemporal production structure is unique to Austrian macroeconomics, as it plays virtually no role in mainstream macroeconomics (Garrison, 2001:45). In mainstream textbooks, capital is often assumed to be constant in the short run. By contrast, in the long run growth models, capital plays an important part, but only as a homogeneous stock that either grows or shrinks (Garrison, 2009:11). The major strength of Austrian macroeconomics then, is exactly that “there *is* a real coupling between the short run and the long run (Garrison, 2001:5). In 1956, Lachmann stated that “apart from some notable exceptions, economists have ceased to ask fundamental questions about capital theory“. There are three reasons for this, he maintained. Firstly, the view gained ground that a theory of capital is not necessary. Secondly, it has proved impossible to find a satisfactory quantitative expression for capital. Thirdly, there is a peculiar relationship between capital and knowledge (Lachmann, 1978: xiii-xiv). As this hardly seems to have changed since Lachmann wrote half a century ago, the Austrian claim is that development and incorporation of capital theory is the most fruitful path forward for macroeconomics.

Obviously, for reasons we shall get back to, capital theory is complex. However, this need not be a large drawback in our case. The model of the capital structure in the ABCT is simple, but the aim is to capture the important elements and enable us to think in terms of the general pattern of macroeconomic intertemporal equilibrium and disequilibrium of

intermediate goods. Garrison argues that “to this end, the still unresolved – and possibly unresolvable – issues of capital theory can be kept at bay. The focus, instead, is on the most fundamental interrelationships among the separate elements of capital-based macroeconomics” (Garrison, 2001:49). The root of the problem in capital theory is the fact that capital resources are heterogeneous and, hence, far less measurable than land and labor. Furthermore, the heterogeneity that is important is not the physical heterogeneity of various capital goods, but rather heterogeneity in use. Since each capital good can only be used for a limited number of purposes, there is no common denominator when it comes to measuring of such goods (Lachmann, 1978:2).

The Austrian capital theory attempts to capture important aspects of the heterogeneity of capital, by focusing on the structure which is made up of capital goods of various orders. The justification for portraying the capital of an economy as a structure relates to the characteristics of capital goods examined in the previous subsection. As we have already seen, capital goods only have value when they form parts of a plan and fit together (Lachmann, 1978:8). A capital structure therefore, is shaped according to the past decisions of entrepreneurs, and according to their expectations about future behavior of consumers and other entrepreneurs (Garrison, 2001:15).

The capital structure of an economy is examined in two dimensions in the Austrian model. First, the model focuses on the length of the capital structure, i.e., on how many orders of intermediate goods that are used in the production of the consumption good. This can also be seen as the chronological time elapse of production, where e.g. the output of the third intermediate stage is a factor of production of the intermediate good of the second stage. In other words, the longer the production structure is, the more time passes between the production of the highest order intermediate good and the final consumption good that the highest order good is a factor in the production of. However, Garrison points out that the time dimension is not measured in pure time units. Rather, “the time dimension measures the extent to which valuable resources are tied up over time (Garrison, 2001:49).” Thus, it is not only the length of which the resources are tied up that matters, but also the value of these tied-up resources. Second, the model also focuses on the discounted value of the goods in the production process. Goods that are currently half-finished are less valuable than the consumption goods, not only because further inputs have to be added for the good to yield utility, but also due to the fact that the good will only be available for consumption some time into the future (Garrison, 2001:46). To illustrate these points regarding the intertemporal pattern, the Hayekian triangle, depicted in figure 3, is brought into the analysis.

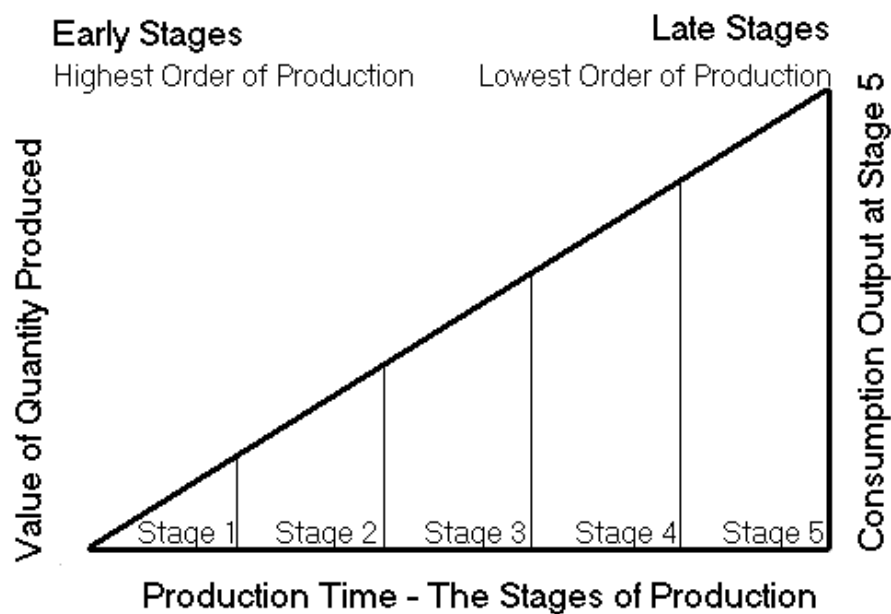


Figure 3: The capital structure of the economy illustrated by the Hayekian triangle.

In this model, the economy is assumed to consist of 5 stages of production, depending on how far away in time the products are from consumption. The goods run from left to right while money moves the opposite way (Huerta de Soto, 2006:304). Column 1 to the left represents the goods of the fifth order, i.e., the goods that are furthest away from consumption. The bar is low, because the value is discounted. This stage of production may for example be thought of as mining. As we move to the right, the bars increase in size as the value of goods of lower order have a higher value. Bar 2 through to 4 may for example represent refining, manufacturing and distributing. Finally, to the right in the figure, column 5 represents goods of the first order that are available for consumption. This stage represents retailing.

The number of stages of capital goods is very important as, *ceteris paribus*, a longer chain of stages will increase the productivity of land and labor. Of course, this does not mean that all long processes are more productive than shorter processes. An investment that lengthens the chain of the production structure implies a prolonged waiting time between the time when the investment is made and the moment at which the consumption goods will be ready. Thus, shorter processes of production are, *ceteris paribus*, preferable to longer processes. However, given the present structure of production, the shortest processes have already been chosen so that further investments must either be used in the creation of a



production structure for a new consumption good, or lengthen the production structure of an already existing good.

As an example, picture Robinson Crusoe on the desert island. Deprived of capital goods, he must use his labor to extract what the nature (land) may offer of goods of the first order, i.e., he must collect by hand the coconuts by climbing to the top of the palm trees, without the use of any tools. Assume, however, that Crusoe has the knowledge (the technology) necessary to produce a stick (a capital good of the second order) with which he can use to knock down the coconuts. Obviously, this would improve his productivity. However, it would of course be even better if Crusoe had even more capital goods at his disposal, for example tools which he could utilize in the production of the sticks, or a machine that could make the stick work automatically. Clearly, a longer chain of intermediate goods would indeed make Crusoe able to produce more consumption goods.

Hence, the purpose of the Hayekian triangle is to emphasize how the decision to forego present consumption releases resources that can be used to increase investment. In the figure, the general time preferences of the economy are depicted by the slope of the hypotenuse, the steepness of which is positively related to the time preferences of the population.

### ***4.3 Money, Interest Rates and the Market for Loanable Funds***

In this section the final building block of the model is introduced as we analyze some topics related to the money market from an Austrian viewpoint. Having developed the model of the capital structure in the previous subsection, we now move on to investigating some factors that come into play when the entrepreneurs' eagerness to invest in capital goods contra consumption goods is determined. First, the Austrian theory of interest rates is presented along with the Wicksellian natural rate of interest. Second, some terminological differences are explained. Lastly, the market for loanable funds is presented as the final building block of our model.

#### **4.3.1 The Austrian Theory of Interest Rates and the Natural Rate of Interest**

Even though an increase in the amount of capital goods expands production possibilities, these goods are always produced at the expense of consumption goods. Hence, since capital goods can only bring about consumption in the future, a production of capital goods involves

the sacrifice of current consumption in exchange for future consumption. In other words, saving- a lower level of consumption- is a necessary prerequisite for the production of capital goods. For the entrepreneurs who direct resources to the production of early intermediate goods, late intermediate goods or consumption goods, a key variable is the interest rate. The reason, according to Huerta de Soto, is that the rate of interest “regulates the relationship between consumption, saving and investment in modern societies” (Huerta de Soto, 2006:284). In the market process, the tendency of entrepreneurial action is always equilibrating in the direction of establishing a uniform rate of interest throughout all time markets in the economy. In the ERE then, the same rate of interest prevails in all stages of all products (Rothbard, 2004:372).

But how, according to Austrian economics, does the pure rate of interest come about? The simple answer is that the rate of interest is determined by the market for the exchange of present goods against future goods throughout the economy (Rothbard, 2004:375). Because of the praxeological fact that humans have time preferences, present goods are preferred to future goods. This discount on future goods as compared with present goods is the rate of interest which prevails in the ERE (Rothbard, 2004:376). In the real world of uncertainty, however, the pure rate of interest determined on the “time market” is intertwined with the entrepreneurial elements of profit and loss. Thus, in the real world, profit consists of two inseparable factors; on the one hand, a compensation for the time that passes between the day that the investments are made and the day that the income is received. On the other hand, the entrepreneurial profit that is gained from the fact that the inputs were undervalued in the market.

In the discussion of interest rates and the ABCT a crucial concept needs to be reviewed, namely the Wicksellian natural rate of interest. Wicksell wrote that

There is a certain rate of interest on loans which is neutral in respect to commodity prices, and tends neither to raise nor to lower them. This is necessarily the same as the rate of interest which would be determined by supply and demand if no use were made of money and all lending were effected in the form of real capital goods. It comes to much the same thing to describe it as the current value of the *natural rate of interest on capital* (Wicksell, 1962[1898]:102).

Thus, the natural rate of interest is the rate that, in theory, would prevail in a real, moneyless economy. Hence, this rate would ensure that money did not have an impact on the overall price level. The natural rate of interest is essential in the ABCT. The most important implication of the theory of the natural rate is that a market rate of interest equal to the natural

rate would maintain a monetary equilibrium throughout the economy, so that money would “allow market participants to avoid the inefficiencies of barter – without introducing any inefficiencies of its own” (Garrison, 2001:52). We denote this rate as the market rate of interest, because this is the actual rate that the entrepreneurs in the market see and use when they calculate the profitability of investment opportunities. However, there is certainly no straightforward answer to the question of which monetary regime that would make this preferable state come about. As we shall see, the ABCT is essentially a story about how the central bank is unfit for this task, as a monetary expansion can bring the market rate of interest below the natural rate<sup>6</sup>.

A remark must be made at this point. Even though Wicksell’s contribution is central to the development of the ABCT, there were important disagreements between Wicksell and Mises over the concept of the natural rate. Firstly, the two authors disagreed regarding the relation between the natural rate of interest and the market rate of interest. Mises argued that the banks could not for a long period of time keep the market rate of interest below the natural rate. If this is attempted, the natural rate will either be reduced to the level of the money rate of interest, resulting from *forced saving*<sup>7</sup>, or the rising prices would push for increased market rates of interest. Wicksell was more ambiguous when it comes to this matter, and did not regard this as such an important consideration (Festré, 2006). Secondly, there is also a disagreement regarding the factors that leads to the difference between the natural rate and the market rate of interest. Wicksell, on the one hand, saw changes in the natural rate mainly as a result of productivity changes. Hence, in his view, a difference between the two rates could occur even if the banks did not expand credit. Mises, on the other hand, was rather claiming that the difference is due to credit expansions by the banks and that this is the cause of the business cycle (Festré, 2006). Although I shall not emphasize these distinctions further in the present exposition, it is still useful to keep them in mind.

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<sup>6</sup> Throughout this exposition I focus on a lowering of the market rate *below* the natural rate rather than *above*, why? Both cases could indeed be worth examining, but the ABCT is a theory about a credit expansion, not a contraction. There are two reasons why we do not discuss a contraction of credit. Firstly, the credit expansion is arguably the more important case as the political and social pressure induces central bankers to expand credit rather than to increase interest rates. Secondly, a decrease in the amount of investment simply reduces the higher-order capital goods and will not cause excess of investments (Rothbard, 2000[1963]:18 footnote).

<sup>7</sup> Although this term is not used to a large extent in the present paper, it will be explained in section 5.3.2. Furthermore, it must be noted that this is a controversial concept. For some discussion of the term, see e.g. (Garrison, 2004).

### 4.3.2 Money: Inflation and Non-Neutrality

The ABCT is hardly a macroeconomic theory in the conventional sense. The level of aggregation is lower than in the Keynesian and New-Classical models as it does not include *the* labor market, *the* price level or, as we have seen, *the* stock of capital goods. Rather, labor markets, relative prices and capital goods vary between the stages of production in the capital structure that we have examined. How can we then justify the ABCT as a macroeconomic theory? According to Garrison,

It is the use of money that puts the macro in macroeconomics. [...] With trivial exceptions, money is on one side of every transaction in modern economies. Unavoidably, however, the medium of exchange is also a medium through which difficulties in any sector of the economy – or difficulties with money itself – get transmitted to all other sectors (Garrison, 2001:7).

Because of this, we need to deal with two important issues of money in order to avoid confusion, namely the definition of inflation and the concept of non-neutrality of money.

Regarding inflation, it is important to note the differing definitions that prevail in the mainstream and in the Austrian literature. While inflation is usually identified as a rise in the general price level, the Austrians object to this definition, claiming that it confuses cause and effect. Rothbard writes that

Prices are highly complex phenomena, activated by many different causal factors. They may increase or decrease from the goods side - i.e., as a result of a change in the supply of goods on the market. They may increase or decrease because of a change in the social demand for money to hold; or they may rise or fall from a change in the supply of money. To lump all of these causes together is misleading, for it glosses over the separate influences, the isolation of which is the goal of science (Rothbard, 2004:1021-1022).

Since prices may remain the same while both the supply of and the demand for money increases, inflation is defined as an increase in the supply of money, rather than an increase in the price level. In the following, I shall mainly speak of changes in the money supply in order to avoid confusion.

The conventional use of the term “neutrality of money” is that money is neutral if changes in the money supply do not change the relative prices (Horwitz, 2000:96). On the one hand, for new-classical theorists, money is neutral both in the short and in the long run, so that a change in the money supply is assumed to have nominal effects only. For monetarists, on the other hand, money is seen as non-neutral in the short run, but in the long run the impact of changes in the money supply only affect the nominal purchasing power of money and real

conditions remain untouched. However, as Horwitz points out, these are descriptions of money properties in an economic model. In this sense, the Austrian view of neutrality must be distinguished from the mainstream's use of the concept. In the latter view neutrality of money implies that money only reproduces the results of a perfectly flexible barter economy. Hence, in this sense, the neutrality of money is a policy aim. An important question therefore is how a monetary regime can provide this preferable result (Horwitz, 2000: 97).

The desirable monetary equilibrium, which prevents a divergence between the supply of and the demand to hold money, will always come about in the long run after the prices have adjusted, but the move towards this equilibrium will subsequently be costly. In a situation of monetary disequilibrium, where the rate of interest does not reflect the natural rate, individual prices carry the burden of adjustment. If we assume that an advance in productivity takes place at certain stages of the economy, the central bank may increase the supply of money in an attempt to match the higher demand and keep prices stable. Hence, since an increase in productivity should allow for lower prices in the sectors in which it occurs, the increase in the money supply distorts the capital structure from the equilibrium path. However, if the model contains no theory of capital, one does not have to take into account these consequences that changes in the money supply necessarily bring about for the capital structure (Horwitz, 2000: 102).

### 4.3.3 The Market for Loanable Funds

The third building block of the ABCT is the market for loanable funds which depicts the coordination of production plans with consumer preferences. In this figure, the supply of loanable funds represents the willingness to lend at different rates of interest, while the demand for loanable funds represents the eagerness to borrow. Thus, the figure illustrates the aggregate supply and demand schedules on the time market (Rothbard, 2004:388-389). The rate of interest,  $i^*$  equates saving and investment. However, because there is always some discoordination in the market process, this is not the “pure” natural rate of interest that would necessarily keep prices stable (Garrison, 2001:38)<sup>8</sup>. If monetary equilibrium is maintained however, the market for loanable funds will smoothly translate the time preferences of the population into intertemporal exchanges.

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<sup>8</sup> There is some controversy among Austrians regarding this issue. Rothbard claims that the intersection of the two curves in the loanable funds market determines *the equilibrium rate of interest*, and that this rate is determined *solely by the time preferences of the individuals in the society, and by no other factor*.

According to Garrison, the supply curve must be interpreted as the net saving that is made available to the business community to finance investment and to maintain and expand the economy's capital structure. I.e. the supply of loanable funds is saving in the macroeconomically relevant sense. In total, the supply of loanable funds represents the part of income that is not spent on consumer goods, but instead put to work earning interest or dividends (Garrison, 2001:36). In a similar way, the demand for loanable funds reflects the willingness of individuals and businesses to pay input prices at the current time in order to sell output at some (expected) price in the future (Garrison, 2001:37). This relationship is depicted in figure 4.

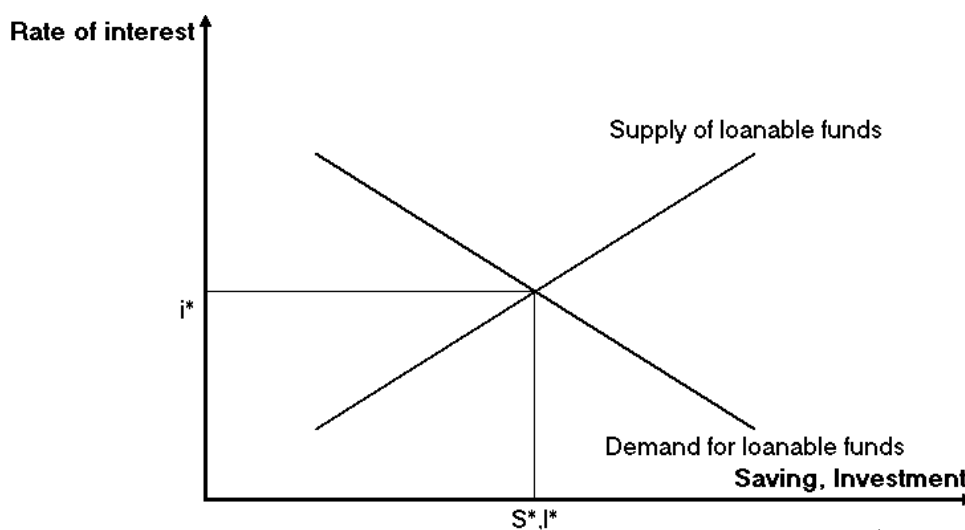


Figure 4: The market for loanable funds.

As Horwitz points out, the savings and investments under consideration are desired *ex ante* amounts. I.e. the figure of the loanable funds market reflects what people want to do. Thus, *ex ante* it is possible that saving is different from investment, but this is not so *ex post* when saving must equal investment (Horwitz, 2000:72-73). In monetary equilibrium then, the market for loanable funds reflects the real time-preference signals of lenders and borrowers.

A few remarks must be made regarding this diagram which is the only figure included by Keynes in *the General Theory* (1936:180). Keynes did so in order to reject it as the “classical theory of interest”, and, according to Krugman, “One of the key insights in Keynes’s General Theory — actually, THE key insight — was that the loanable funds theory of the interest rate was incomplete” (Krugman, 2009). Does this imply that the ABCT can be rejected due to a failure to incorporate money in the analysis?

It is not quite that simple. Garrison explains that the understanding of saving in this case lays “somewhere between the understandings of neoclassical growth theory and of Keynesian macroeconomics. [...] Saving in capital-based macroeconomics means the accumulation of purchasing power to be exercised sometime in the future” (Garrison, 2001:39-40). Furthermore, the absence of money is due to the fact that the diagrams presented so far belong to the realm of pure theory, depicting the real economy where money introduces no inefficiencies. Thus, an increase in the quantity of money will create an increase in the supply of loanable funds and play an important part in the analysis. Also, the loanable funds diagram can easily take into account changes in the liquidity preferences which, as Keynes correctly observed, would prevent savings from being supplied as loanable funds to the same extent. An increase in the liquidity preferences, i.e. if people were more eager to hold money, would reduce the correlation between savings and the supply of loanable funds (Garrison, 2001:37).

For the entrepreneurs, the real rate of interest reflects the time preference of the consumers. A low interest implies that savings are relatively abundant. This is a signal to the entrepreneurs that more present goods are available, and thus that longer and more complex chains of production are profitable. Correspondingly, a high rate of interest shows that savings are scarce and that entrepreneurs should avoid lengthening the structure of production. If they were to do so, they would soon go out of business because the discounted value of these early capital goods would be too low (recall how the bars on the figure depicting the early capital goods were low). To illustrate with our Crusoe example once more, this is equivalent to a situation in which Crusoe would save up one days worth of coconuts and begin to construct a boat of which he could catch fish, only to realize at the end of the day that the boat was far from complete and that he was out of food. In short,

the interest rate conveys to entrepreneurs which new productive stages or investment projects they can and should embark upon and which they should not, in order to keep coordinated, [...], the behavior of savers, consumers, and investors, and to prevent the different productive stages from remaining unnecessarily short or becoming too long (Huerta de Soto, 2006:291).

Hence, given that money has no offsetting effect, the interest rate that prevails on the market for loanable funds provides an intertemporal signal to the entrepreneurs by reflecting the time preferences of the consumers.

## 5.0 The Austrian Business Cycle Theory

We shall follow other modern presentations of the ABCT, mainly (Garrison, 2001:57-83) and (Huerta de Soto, 2006:313-395), in contrasting the boom that necessarily implies the bust, with a boom that is sustainable due to the fact that it is supported by a change in real conditions. First, the three building blocks of chapter 4 are put together in order to obtain a macroeconomic perspective of the evenly rotating equilibrium model. Second, we use this to investigate how a change in saving will affect the different components of the economy. Third, we analyze the ABCT which supposedly is caused by a credit expansion unsupported by voluntary saving. Fourth, we illustrate the ABCT with a mathematical model.

### 5.1 The Model: Our Building Blocks Put Together

Finally, the three building blocks are assembled in figure 5, made up of the capital structure, the PPF representing the trade-off between consumption and investment, and the market for loanable funds.

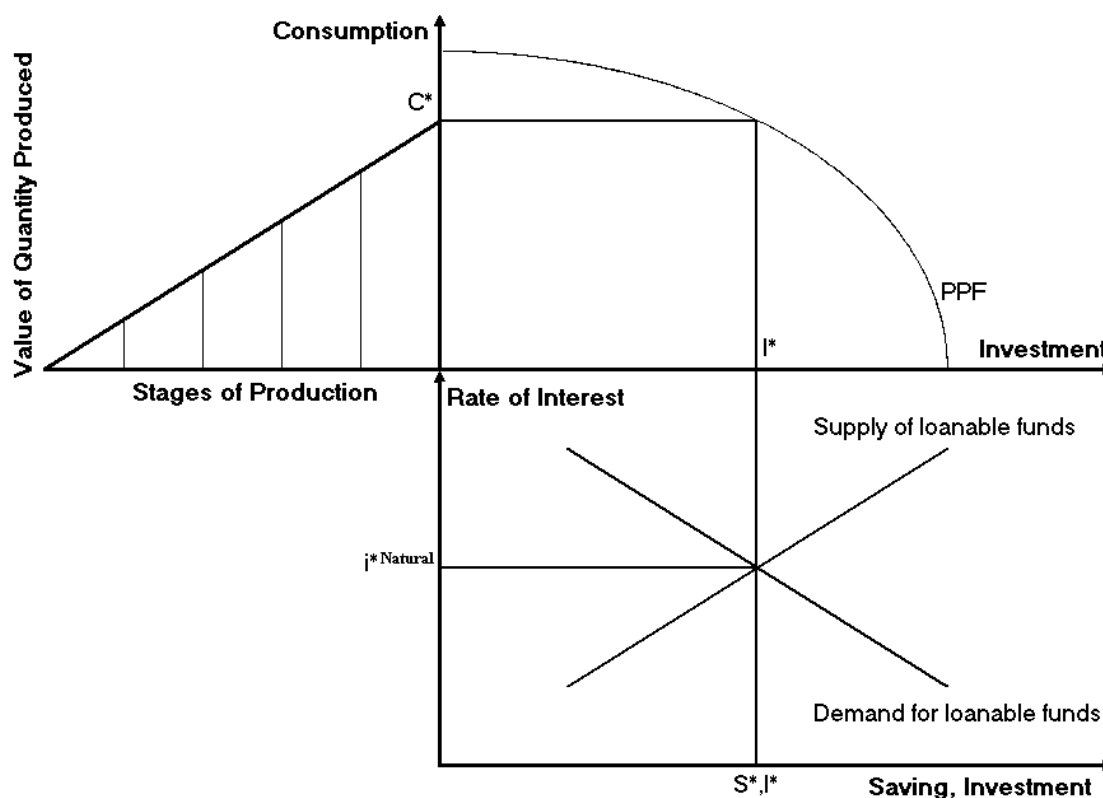


Figure 5: A benchmark equilibrium model for the Austrian business cycle theory.



In this figure, the three models are tied together, so that changes in one will affect the other two. While the market for loanable funds and the PPF both include investment, the PPF and the model of the capital structure both include consumption. According to Garrison, there is also a less obvious connection in the model, in that the slope of the hypotenuse of the Hayekian triangle reflects the market-clearing rate of interest in the market for loanable funds (Garrison, 2001:50). Under given conditions, a lower (higher) rate of interest will imply a shallower and longer (steeper and shorter) slope of the capital structure, due to the fact that the present, discounted value of the capital goods increases proportionally as the rate of interest goes down. The interest rate that prevails in this stable system is the Wicksellian natural rate of interest, so the monetary equilibrium is maintained. Furthermore, this model depicts a wholly private economy or the private sector of a mixed economy whose public-sector budget is in balance (Garrison, 2001:50).

## ***5.2 Change in Intertemporal Preferences***

Before we analyze how the boom is followed by a necessary bust in the Austrian scheme, it will be useful to investigate the comparative statics of a case where the boom is in fact sustainable due to changes in the real factors. In order to do so we analyze the effects of a reduction in the aggregate time preferences of the population. As people's desire to consume now rather than in the future goes down, the demand for current consumption goods decreases so that more resources are available for the production of capital goods. Thus, purchasing power is accumulated as the amount of saving increases and the supply curve of loanable funds shifts from  $S_1$  towards  $S_2$ . Assuming, as was explained earlier, that people save-up-for-something, a new equilibrium in the loanable funds market is established at a lower rate of interest. The decline in the interest rate and in consumption now changes the structure of production. The lower rate of interest, reflecting that more resources are available, induces the entrepreneurs to increase investment so that we move from A towards B on the sustainable PPF. Note here that if the rate of interest did *not* drop, for example because savings were hoarded (instead of supplied at the market for loanable funds) or due to the fact that the central bank kept interest rates at the same higher level, the Keynesian paradox of thrift would be confirmed. However, we can deal with this by assuming that the monetary authority plays

no offsetting role, so that the central bank does not intervene and prevent the interest rate from dropping. In other words, the supply of money is assumed to be constant.

So far, the interest rate and consumption has dropped, while there has been an increase in investment due to the increase in savings. To analyze the effects on the capital structure, we can distinguish between three mechanisms. Note first the *derived demand* effect. As the demand for consumption goes down, so does the demand for the capital goods that are close in time to the consumption goods. As we move “upstream”, the demand for capital goods drops less the more remote from consumption they are in temporal proximity. Thus, this effect tends to make the early capital goods more profitable compared to the later capital goods. The second effect is identified by Huerta de Soto as *the Ricardo effect*. Denoting  $W$  as the average wage level and  $P$  as the average price of consumer goods, it is clear that the reduced demand for consumer goods leads to an increase in the real wages,  $W/P$ , as  $P$  drops. Thus, the price of labor increases compared to capital. The fact that labor is more expensive compared to capital, means that the costs of production increase more in the late, labor intensive stages than in the earlier capital intensive ones. Hence, the profits in the production of higher order goods increase relatively to the profits in the later stages. The third effect is the *time discount effect*. The reduced rate of interest implies that the more prolonged the methods of production are, the more profitable they become. This owes to the fact that the time element matters less, i.e., the discounted profits of the higher order goods increase. In total then, the early stages of production are more profitable than the later stages, so the entrepreneurs will direct resources to earlier capital goods. This explains why the capital structure rotates clockwise in figure 6.

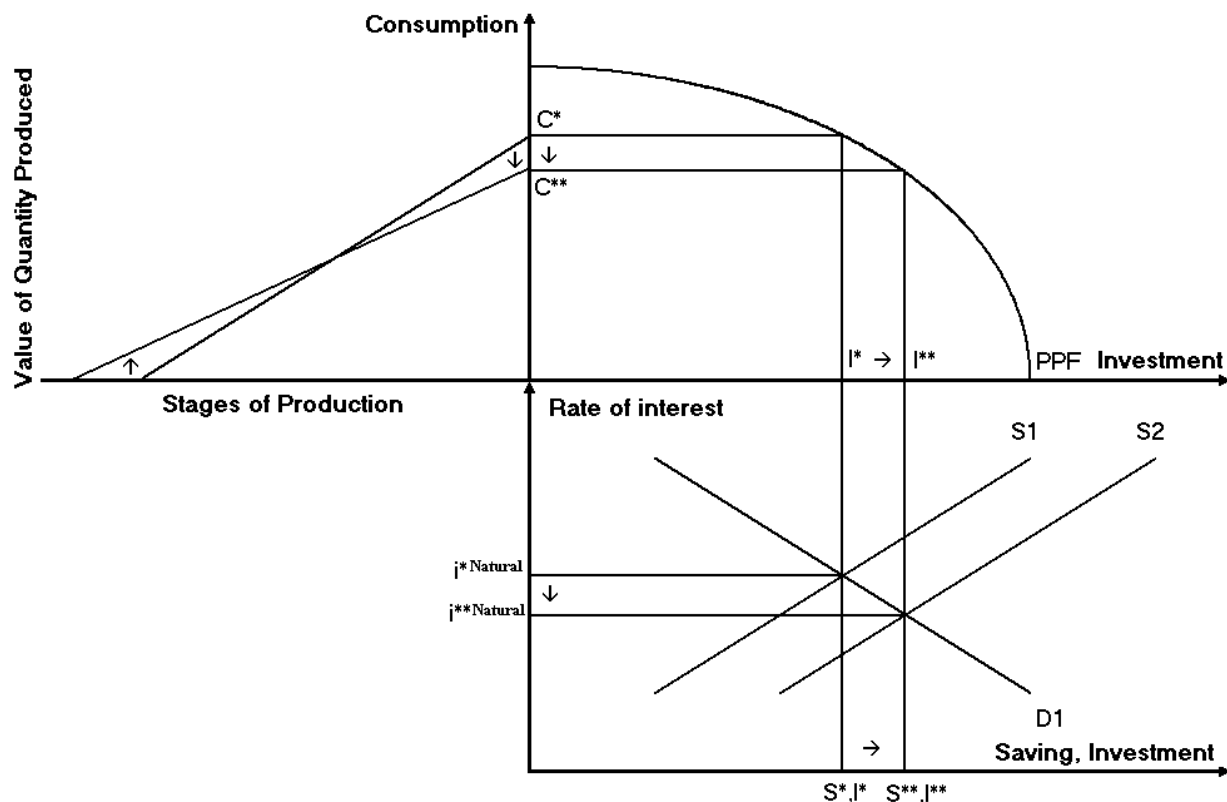


Figure 6: Effects of a reduction in intertemporal preferences.

From the figure we see that there is a heightening of the value of capital goods in the early stages and a lowering in the later stages. This is due to the fact that more activities of the former have become marginally productive, while more of the latter have become marginally inefficient due to the lowering of the rate of interest. In addition to this, however, the structure of production also increases in length as new stages even further from consumption appear to be profitable in the new situation with lower intertemporal preferences.

Next, by utilizing figure 2 on page 28, we can see how the current sacrifice of consumption makes the economy grow faster than it would have done if the change in the intertemporal preferences had not taken place. Because investment has moved from  $I^*$  to  $I^{**}$ , the amount of net investment has increased. Assuming that there were no technological improvements and that the investment amount  $I^*$  was just enough to replace the depreciating capital, net investment was equal to zero before the change in preferences and, hence, there was no growth. As a result of these assumptions, the PPF could not have been expanded, so the economy would have kept producing an amount of consumption goods equal to  $C^*$  and investment goods equal to  $I^*$ . The expansion is illustrated in figure 7.

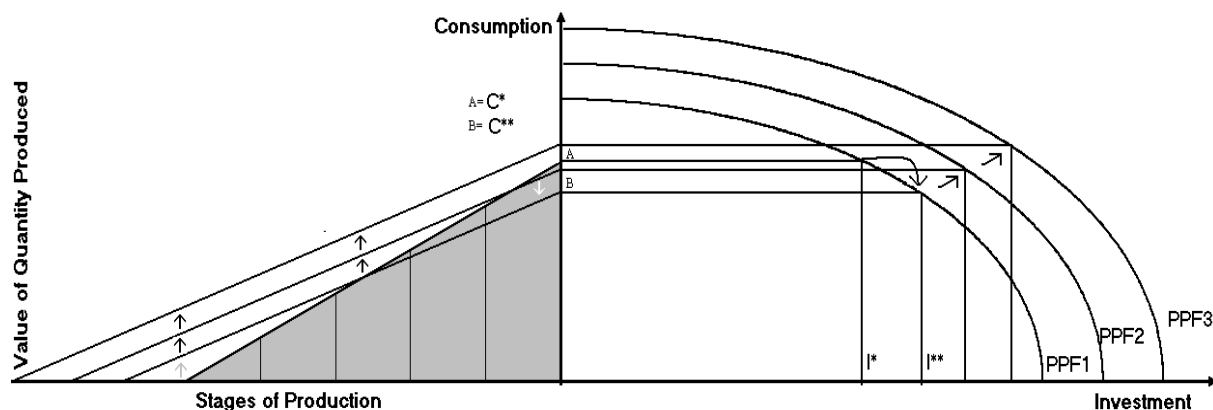


Figure 7: Expansion of the PPF and the capital structure induced by a reduction in the intertemporal preferences.

The change in intertemporal preferences has shifted resources from the production of consumption goods ( $C^*$  decreased to  $C^{**}$ ) in order to increase the production of investment goods ( $I^*$  increased to  $I^{**}$ ). Because of this, the PPF can expand in future periods, allowing for an increase in the production of *both* consumption and production goods. From the figure we see that the sustainable constraints of the economy shifts out from PPF1 to PPF2, allowing for an increase in both consumption and investment. The available amount of consumption goods is still lower than it was prior to the increase in saving, but as time goes by and the new growth rate allows the PPF to expand even more, the thriftiness of the population is rewarded with a higher sustainable level of consumption and investment goods, compared to what was possible prior to the change. This is illustrated further in the capital structure in the left part of the figure, where the reduction in the intertemporal preferences causes resources to be shifted from the later to the earlier periods of production. This is illustrated by the rotation of the initial structure, the area under which is shaded grey. The rotation is shown by the white and grey arrows. The new capital structure supports less consumption than before, namely  $C^{**}$  (marked by B for convenience), but the thriftiness of the consumers allows the economy to grow. This can be seen from the fact that the new capital structure in turn expands outwards and after some time supports a level of consumption higher than the initial level  $C^*$ .

### 5.3 The Model of the Business Cycle: Credit Expansion and Malinvestment

Finally, we are ready to present the Austrian explanation for economic downturns. Although the essence of the model is fairly easy to grasp, it consists of a number of mechanisms and lags that are not straightforward. Because of this, the theory will be presented from three different viewpoints in the following subsections. First, I shall analyze the ABCT in the three-quadrant figure that has been developed in the preceding sections. Second, focus is shifted to the trade-off between consumption and investment in order to explain how, according to the theory, boom is necessarily followed by bust. Third, the microeconomic mechanisms that make this sequence of events come about are discussed.

#### 5.3.1 An Outline of Boom and Bust

The ABCT is a monetary theory of the cycle, meaning that an artificial credit expansion leads to overinvestment and overconsumption. However, more important for the theory is the fact that the credit expansion is claimed to distort the capital structure, a phenomenon which is called *malinvestment*. The latter term is essential and needs to be explained. Malinvestment is not the same as disinvestment, which Keynes defines as “negative investment” (Keynes, 1936:75). Rather, the term means that the *wrong kind* of capital goods are produced compared to what the consumers want. This is what the ABCT ultimately is about. Malinvestment always occurs in a world of uncertainty, but the path towards equilibrium of the capital structure is always tending towards the smooth Hayekian triangle in which no resources are malinvested. Thus, malinvestment cannot be avoided in the real world. What can be avoided however is *systematic malinvestment*, and this, according to the Austrian School, is the cause of business cycles. This interpretation of the ABCT indicates a strong resemblance with the economic calculation debate of the interwar period which was referred to on page 9<sup>9</sup>. In this debate, Mises and Hayek argued that the economy of a socialist state could not be rational, because there would no longer be any price signals to reflect the real scarcities and preferences. Arguably, this was part of the explanation for the grim conditions in the Soviet Union in which, by popular belief, bread was absent from the stores while thousands of pairs of shoes, for which there was no demand, left the factories. This can exemplify what malinvestment means. If resources have been invested in the production of shoes because the (price) signals from which the entrepreneurs acted did not reflect reality,

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<sup>9</sup> For an Austrian review of this debate see e.g. Hoff (1949[1938]).

these resources cannot costlessly be transformed to the production of a good more in demand. In other words, capital goods are specific. As we shall see, the ABCT provides an example of how such malinvestments may occur if the central bank creates a spread between the market rate of interest and the natural rate.

While the natural rate of interest prevailed in the model we have analyzed so far, this is very unlikely to be the case when a monetary authority, such as the central bank, is able to control the supply of money. The central bank has the opportunity to lower the market rate of interest that is prevailing in the economy by increasing the supply of money. To explain how boom and bust supposedly comes about, we analyze the effect of an injection of credit into the economy in figure 8, when intertemporal preferences are kept constant.

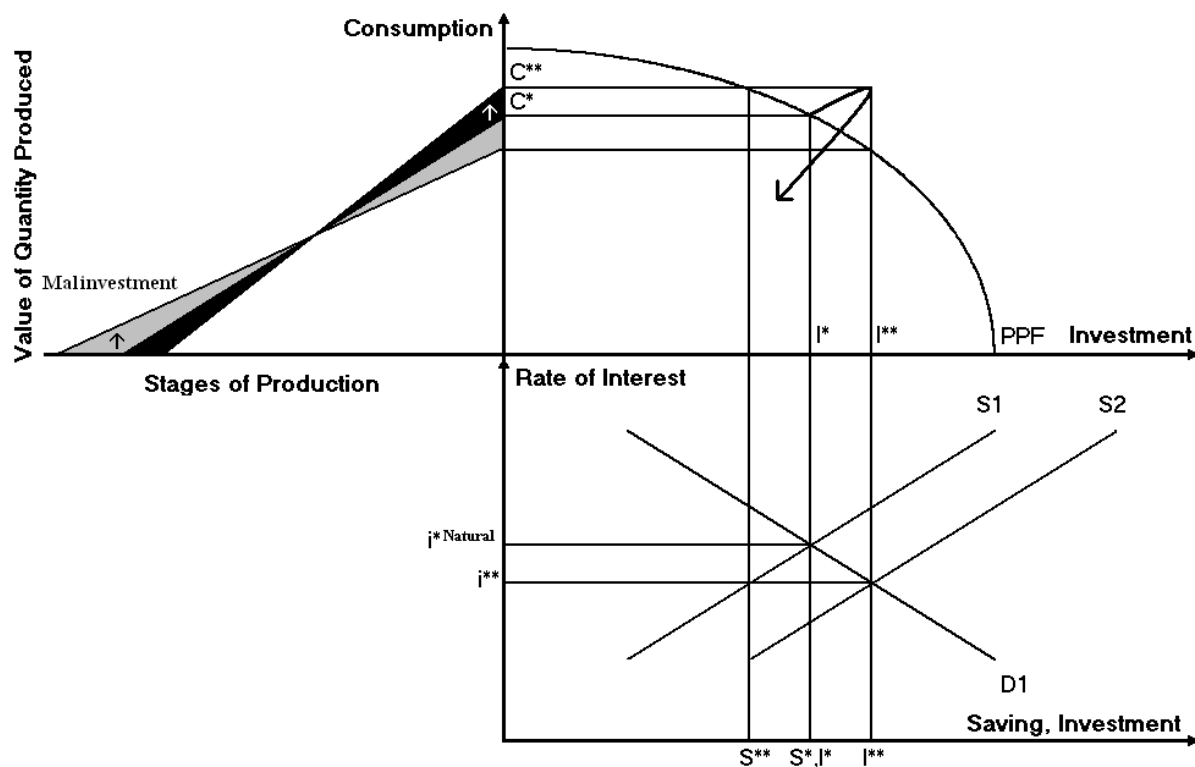


Figure 8: The Austrian business cycle theory.

Assume that the central bank expands the money supply, so that the supply of loanable funds is shifted from  $S_1$  to  $S_2$  in the lower quadrant. Because of this, a difference is created between the natural rate of interest and the market rate. A crucial assumption is that the entrepreneurs are unable to distinguish between an increase in saving and a monetary expansion. Thus, the entrepreneurs react similarly to what the case was when the intertemporal preferences had changed. As they interpret the lower interest rate as a signal of

increased profitability in more time-consuming production methods, they increase the invested amount from  $I^*$  to  $I^{**}$ . However, there has been no increase in savings. Contrarily, the lower rate of interest induces people to save less, that is, to increase consumption. So private saving is reduced from  $S^*$  to  $S^{**}$ .

As can be seen from the market for loanable funds, the preferred amount to save is no longer equal to the preferred level of investment, because both consumers and investors act according to a signal that no longer reflects economic realities. Moving up to the PPF, we see the upward movement of the cycle, i.e. the boom. Since the injection of credit makes *both* consumption and investment increase, the economy moves outside the PPF as opposing forces pull the economy in different directions. This is reflected further in the capital structure. As can be seen from figure 8, the capital structure expands in an unsustainable way. Compared with the situation prior to the credit expansion, more resources are invested into the early stages of production, which explains the lengthening and heightening of the left side of the Hayekian triangle, illustrated by the grey area. The crucial point is that these investments are sustainable only if resources are taken from the late stages close to consumption. However, since consumption has gone up rather than down, more resources are invested in the late stages at the same time. This is depicted by the black area. Hence, as the figure illustrates, the capital structure is pulled in both directions at the expense of the middle. Since the structure has lost its smooth and sustainable triangular shape, associated with monetary equilibrium, the investments made are not consistent with the time preferences of the population. Resources are invested in the earlier stages of production even though the intertemporal preferences of the consumers does not justify such a long waiting time. In other words, resources are invested in the wrong kinds of capital goods; there is malinvestment. In the Austrian view then, to the extent that these capital goods are specific, these resources need to be reallocated in a way that fits consumer preferences. To the extent that the malinvested goods are specific, this is a costly and time-consuming process; a recession has to come about in order to adjust the economy to the wastes and errors of the boom, and reestablish efficient service of consumer desires. This must happen before the economy may again grow in a sustainable way. Hence, the depression is really the “recovery process” (Rothbard, 2000[1963]:12).

### 5.3.2 The Mechanisms at Work

In order to investigate what actually takes place during the boom and bust in the Austrian scheme, it is useful to analyze the various mechanisms in further detail. In this subsection, I shall do this by utilizing figure 9. Assume, as before, that the economy is located at the PPF at

the outset, marked by point 1. During the boom period, the economic actors are optimistic as all economic indicators are positive and the expansionary monetary policy allows both consumption and investment to expand outside the PPF, represented by point 2. However, an allocation that exceeds the sustainable PPF cannot go on forever and will soon be constrained by the increasingly binding scarcity. For a while, both overinvestment and overconsumption may take place at the same time, but since saving and investment needs to be equal *ex post*, the allocation outside the PPF will not expand symmetrically between consumption and investment. Rather, there is a bias that relates to how the credit of the expansion enters the economy. Contrary to the traditional assumption of a simple “helicopter drop” that spreads equally throughout the economy, investors are assumed to get the new money first through the credit markets. Furthermore, since the structure of production has been altered due to malinvestments, consumers are demanding more goods than the capital structure can provide. This happens when the projects in the middle stages of the production process reach the late stages. Hence, the output mix of the PPF move towards increased investment and reduced consumption, even though consumers would be willing to save less at the given market rate of interest. This is represented by points 3 and 4 where consumption reaches its maximum while investment is still increasing. This phenomenon, where consumption has to be decreased due to malinvestments in the past, is identified in the Austrian literature as *forced saving* and is the beginning of the necessary downturn. In this situation, the rate of interest is pushed upwards again because of high economic activity, provided that there are no further changes in the money supply.

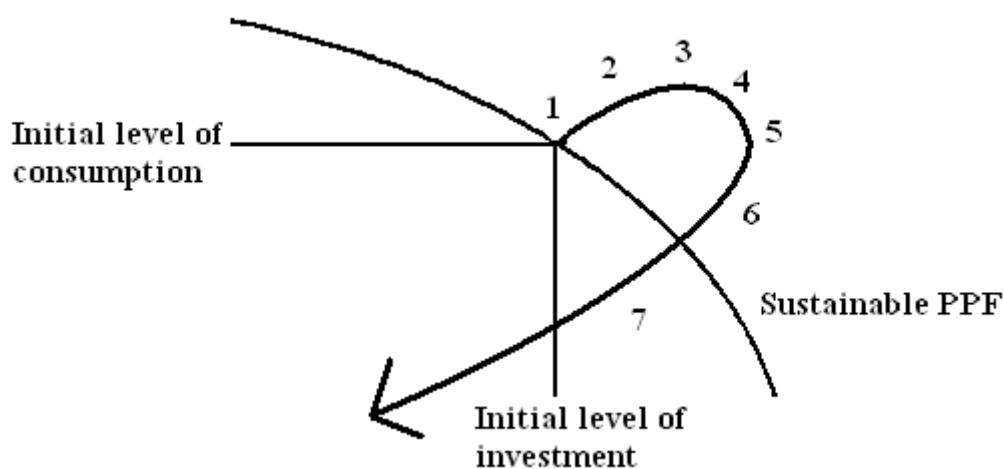


Figure 9: The boom and bust mechanisms- a close-up view of the PPF (Garrison, 2004:340).



The cause of the *forced saving*, namely overinvestment, can still continue for a while, because the investors get the new money first and still see it as profitable to increase investment in the early stages. However, the maximum point of investment, marked by point 5, will sooner or later be reached, as many of the projects in the early stages will prove to be redundant due to the fact that the demand from owners of lower order capital goods is not as expected and because of increasing rates of interest.

The result of this is that business ventures, especially in the early stages of production, turn out to be unprofitable and workers must be laid off. The *overconsumption* and the *overinvestment* must necessarily end with a downturn because of the *malinvestments*. According to the Austrian theory, once the “cheap credit” is injected into the economic system, there is no way to avoid a painful period of readjustment, because the capital structure of the economy has been altered in an artificial and unsustainable way. In other words, injecting more money into the economy cannot result in a “soft landing” for the economy, but will only delay and enlarge the problems as the resources in the capital structure become even more *malinvested*. Thus, although the Austrian theory is similar to the Monetarist explanation for the business cycle, there is a distinct difference. Monetarists, on the one hand, usually claim that the recession could be avoided as long as the central bank ensured a steady growth in the money supply. On the other hand, Austrians claim that it is the initial increase in the money supply that gets the unsustainable boom going, and that a further monetary expansion only will delay and augment the recession by maintaining and aggravating the unsustainable capital structure.

As the overinvestment comes to a halt, the liquidation process begins, given that it is not disrupted by further expansionary monetary policies. This necessary downturn is illustrated by point 6. The implication of this is that the resources that were employed in the early stages of production during the boom are now reallocated to the later stages. Both consumption and investment drops further during this process, as the economy moves inside the PPF, depicted by point 7. According to the Austrian theory, this liquidation process may be mild if the capital structure is not distorted further by expansionary policies. However, to the extent that the liquidation process has been prevented for a long time in this way, the recession may be severe and the economy may spiral far into the PPF, following the arrow. From an Austrian viewpoint, this is a “secondary depression”, which is distinguished from the initial monetary expansion cause. Garrison claims that it was this secondary depression that Keynes focused on in the *General Theory* (Garrison, 2001:75).

### 5.3.3 The Microeconomic Forces of Boom and Bust

As we have seen in the previous two subsections, the effects of the credit expansion must be reversed when it has been revealed that investments in the early stages are at odds with the current level of consumption. The market rate of interest must again converge with the natural rate. A following analysis of how this fact is revealed to the entrepreneurs through microeconomic mechanisms may shed further light on the theory. In doing so, I shall rely on the analysis of Huerta de Soto (2006:363-380).

The first thing to happen after the credit expansion is that the entrepreneurs increase the demand for original factors of production such as labor and land. As the lower rate of interest signals that a lengthening of the production structure is profitable, entrepreneurs raise the prices of the factors in order to invest in early stages of capital goods. Simultaneously, consumption has increased due to the lowering of the interest rate<sup>10</sup>. Hence, factors of production, in particular labor, are being more intensely demanded also by the entrepreneurs who operate in the late stages of production. The result of these two factors is that the price of land and labor is being pushed up. However, as argued in the previous section, there is an investment wage-lag which still allows the upturn to take place. This is due to the fact the entrepreneurs, who borrow money from the banks, are able to obtain the benefits of the credit expansion before prices increase throughout the rest of the economy. Thus, *early on in the boom period, factor prices soar as entrepreneurs who invest in the early stages increase their demand for original factors.*

This increase in the factor prices is central in the explanation for why the spread between the natural rate of interest and the market rate must be equalized. The increased monetary returns to land and labor will make land owners and wage earners better off, in turn; they will demand more consumption goods and therefore contribute to increasing prices for these goods. However, two other factors further increase the price of consumption goods without having an effect on the factor prices. Hence, prices of consumption goods will therefore increase relatively to the factor prices. The first reason for this is that there is a scarcity of consumption goods, which stems from the unsustainable capital structure. Since resources were allocated away from the middle of the production structure, there are not enough capital goods available to produce the demanded consumer goods. This leads to a decrease in the production of consumption goods in the short and in the medium run.

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<sup>10</sup> Huerta de Soto (2006:363) assumes that consumption does not change following the credit expansion, only that investment increases. Since this does not appear to alter the theories conclusions, I continue to assume, with Garrison, that the credit expansion increases consumption as well.

Secondly, on average, entrepreneurs have also experienced higher expected profits due to the monetary expansion. This increases the upwards pressure on the prices of consumption goods as entrepreneurs also demand more. In total then, because of the prolonged structure of production, *there will be a delay in the production of consumption goods for a long period of time, leading to a more-than-proportional increase in the prices of these goods, compared to the price of the original factors of production.*

Due to the steep increase in the prices of consumer goods, larger than the increase in factor prices, the changes in accounting profits will be different in the late and early stages of production. The producers in the stages closest to consumption will be able to obtain higher profits as the prices of consumption goods increase more than the factor prices. Contrarily, in the early stages the price of the intermediate goods will increase only slightly, so that profits decrease. For this reason, the entrepreneurs will begin to reevaluate their choices to invest in the early stages, as it turns out that the later stages are relatively more profitable. Hence, *on the margin, there will be relatively larger opportunities to obtain profit in the late stages of production, compared with the early stages of production.*

In the case where the amount of voluntary saving increased, as we examined in the last section, a *Ricardo effect* occurred as the demand for consumption dropped. This leads to an increase in real wages. In this case, the credit expansion has rather lead to an increase in the price of consumption goods. Thus, a reversed Ricardo effect will come about. As the price of consumer goods increase more than the average wage level, real wages drop. The consequence of this is that the capital intensive goods of the early stages become even more expensive to produce compared to the relatively more labor-intensive late stages. In other words, *the decrease in the real wages makes the late stages of production even more profitable when compared to the early stages.*

Huerta de Soto claims that the credit expansion sooner or later will come to a halt, so that the amount of money in the economy may be assumed to be constant once more. The rate of interest will therefore adjust back towards its natural level. However, due to the increase in the prices of consumption goods, the interest rate will rise to an even higher level than prior to the credit expansion, because lenders have begun to add a component of inflation to the interest rate. As we saw in section 4.2.1, the claim that the rate of interest will increase above its “pre-expansion level is further reinforced by the fact that investment in capital goods also requires investments in complementary capital goods in order to be valuable. I.e. entrepreneurs who realize that they have made a faulty investment due to the artificial rate of interest, may still have an incentive to make further investments. If an investment project at an

early stage cannot be completed because the boom has been turned into bust, the entrepreneur may still want to invest in complementary capital goods in order to reduce his losses. As an example, we may imagine an entrepreneur who, because of the artificially low rate of interest, has invested in a project to construct and build large cranes that are essential in the production of large tankers. However, when the cranes are ready, the economic realities have hit and it becomes evident that the given time preferences, resources and technologies do not make such an investment profitable, i.e. no one is willing to construct tankers and hence, there is no demand for the cranes. To reduce his losses then, the entrepreneur may decide to invest in the tankers himself. Quoting the title of Hayek's article, we may say that the mistaken investment becomes an "investment that raises the demand for capital" (Hayek, 1937), and thereby also the rate of interest. Hence, *when the credit expansion comes to a halt, forces pull the market rate of interest up, and above, the rate that prevailed prior to the credit expansion.*

To sum up, it sooner or later becomes evident that the monetary expansion that was launched by the central bank has led to a malinvestment that has to be liquidated. As the market rate of interest was below the natural rate, the entrepreneurs responded to artificial signals and invested in more time consuming or, equivalently, more interest sensitive production processes. However, as this was at odds with the (time) preferences of the consumers, these ventures appeared to be unprofitable when the credit expansion came to an end. The logical explanation for this drop in profit is that consumption never decreased, so that the factor prices ended up being higher than the entrepreneurs expected.

### 5.3.4 Summary of the ABCT

The Austrian business cycle theory is a monetary theory. Since prices signal the real state of the economy and because money nearly always is on one side of every transaction, changes in the supply of money may affect the price signals of the economy in general. Given that the central bank increases the supply of money so that the market rate of interest becomes lower than the natural rate, entrepreneurs are deceived by the new price signals. Due to the credit expansion, entrepreneurs act *as if* savings have increased and more resources are available. However, the increase in investment is not accompanied by less saving, but, on the contrary, by overconsumption. However, this situation cannot last forever. The credit expansion must eventually come to a halt, and some of the invested resources need to be liquidated. The reason is found in the Austrian capital theory. When the central bank increases the supply of money, it alters the capital structure of the economy by lowering the relative production costs of capital goods that are early in the production process. But this kind of lengthening of the

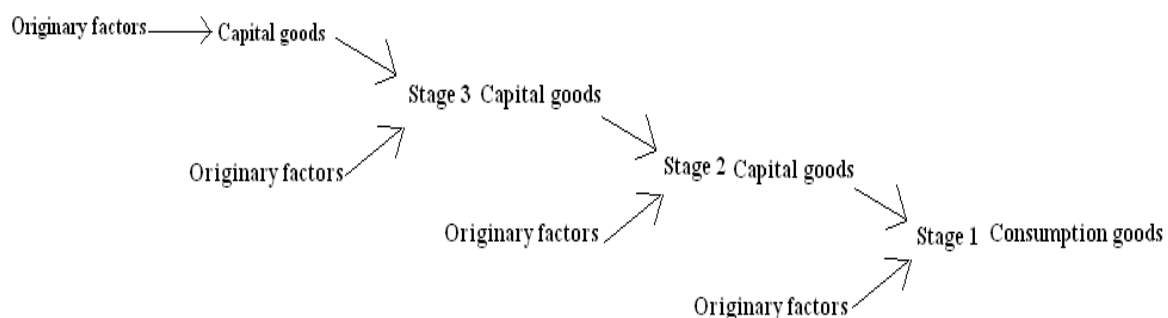
structure is only sustainable if consumption has decreased so that resources from the later stages of production can be employed in a way that make the longer process sustainable. Because the reduction of the rate of interest that makes it profitable to invest in the early stages is caused, not by an abundance of resources due to increased saving, but rather because of an artificial monetary expansion, the new investments are at odds with consumer preferences. There has been malinvestment which sooner or later needs to be liquidated, a process that will lead to the failure of businesses and structural unemployment. This is the Austrian explanation for the business cycle.

#### ***5.4 A Mathematical Model of the Austrian Business Cycle Theory***

Due to the Austrian skepticism regarding the use of mathematics in economics, the formal models in the Austrian literature are few and far between. However, Fillieule (2007) is an exception, and I will utilize his article when attempting to illustrate the consequences of the ABCT mathematically. This equilibrium model focuses on how profit changes in the stages of production, given a specified level of macroeconomic variables.

##### **5.4.1 Equilibrium model**

We are once more looking at a private, closed economy, in which production is carried out through successive stages that occur simultaneously. The output of one stage is a capital good that is used in the production process of the next stage, along with originary factors (land and labor). This structure continues until the consumption good is ready, as depicted in figure 10.



*Figure 10: An input-output view of the capital structure.*

We begin by developing the static equilibrium, in which the same structure recurs every year. Fillieule assumes the following: There is no entrepreneurship and only two kinds

of economic agents exist, owners of originary factors of production and capitalists. The capitalists pay wages and rents to owners of the originary factors, buy capital goods from the capitalists of the previous stage, combine these inputs in a specific stage, and wait until the end of the process to get the net income which is an interest on invested capital. We assume that each stage of production lasts one year, and that the services of the factors of production are entirely paid on the 1<sup>st</sup> of January each year. This implies that the equilibrium rate of interest is unique and that the price of a produced good is  $p_G = (1 + i)p_F$ , where  $p_F$  is the price of its factors and  $i$  the annual equilibrium rate of interest. We also assume that there are no durable capital goods, i.e. the capital goods are entirely used up in the duration of a stage of production. Furthermore it is assumed that the proportion of the value of originary factors to invest is a constant across stages, i.e., the structure is proportional. Thus, in a given production structure the same relative amount of capital goods to originary factors is used in each stage. We denote a given stage of production by  $n$ , at which the total investment spending is  $I_n$ , which is a sum of the expenditure on originary factors,  $I_{OFn}$ , and on capital goods,  $I_{KGn}$ , so that  $I_n = I_{OFn} + I_{KGn}$ . The proportional structure hypothesis implies that

$$a_n = \frac{I_{OFn}}{I_n} \text{ is a constant, } a_n = a.$$

Next, we derive the equilibrium structure which is entirely determined by the three parameters  $C$ ,  $i$  and  $a$ .  $C$  is the annual aggregate spending on consumer goods,  $i$  is the annual originary rate of interest, and  $a$ , as we have seen, is the ratio of originary factors to investment at each stage. The calculation begins at stage 1 and then proceeds backwards to stage 2, 3, 4, ...,  $n$ .

*Stage 1.* This is the last stage in which the consumer goods, with an aggregate value of  $C$ , are produced. The consumption goods are produced by a combination of the factors of production of stage 1, whose aggregate value is  $I_1$  (investment at stage 1). In equilibrium, the sale of consumer goods just suffices to cover the expenses of production  $I_1$  and the interest income  $iI_1$  of the capitalists of stage 1:  $C = I_1(1 + i)$ .

*Stage 2.* The aggregate value of the capital goods at stage 1 is  $I_{KG1} = (1 - a)I_1$ . These capital goods have been produced in the course of stage 2 by the factors of production of stage 2. In equilibrium, the sale of the capital goods of stage 1,  $I_{KG1}$  just suffices to cover the productive expenses  $I_2$  of stage 2 and the interest income  $iI_2$  on investment:  $I_{KG1} = I_2(1 + i)$ ,

or equivalently  $(1-a)I_1 = I_2(1+i)$ , and the value of  $I_2$  is deduced from the values of  $I_1, i$  and  $a$ .

*Stage  $n$  ( $n \geq 2$ ).* The factors of stage  $n$  produce the capital goods of stage  $(n-1)$ . In equilibrium, the sale of the capital goods of stage  $n-1$  just suffice to cover the productive expenses so that  $(1-a)I_{n-1} = I_n(1+i)$ .

These formulas may be utilized in order to obtain the value of investment at each stage. Solving stage 1 for  $I_1$  we obtain

$$I_1 = \left( \frac{C}{1+i} \right)$$

By solving for  $I_2$  in stage 2, we can substitute for  $I_1$  in order to get the expression for the value of investment at stage 2

$$I_2 = I_1 \left( \frac{1-a}{1+i} \right) = \left( \frac{C}{1+i} \right) \left( \frac{1-a}{1+i} \right)$$

The annual investment  $I_n$  at any stage  $n$  may be expressed as a function of the three parameters  $(C, i, a)$  and of the number  $n$ .

$$I_n = \left( \frac{C}{1+i} \right) \left( \frac{1-a}{1+i} \right)^{n-1}$$

Furthermore, we have that the total sum of  $I$  can be expressed as

$$I = \sum_{n=1}^{\infty} I_n = \frac{C}{1+i} \sum_{n=1}^{\infty} \left( \frac{1-a}{1+i} \right)^{n-1}$$

By utilizing the rule of the infinite sum, where  $(1+q+q^2+q^3+\dots+q^n+\dots)$  converges towards  $1/(1-q)$ , if  $0 \leq q < 1$ , and defining  $q = (1-a)/(1+i)$  we obtain the equation for total investment:

$$I = \frac{C}{1+i} \frac{1}{\left( 1 - \frac{1-a}{1+i} \right)} = \frac{C}{i+a}$$

### 5.4.2 Macro Dynamics

Next, I will attempt to show how a monetary expansion may cause a downturn, given that the entrepreneurs mistakenly interpret the lower rate of interest as a signal of lower intertemporal preferences. Following Fillieule, a (perceived) increase in savings may be illustrated by considering a new structure of production with the variables  $(C', I', i')$ , where consumption

spending is lower  $C' < C$ , investment spending is higher  $I' > I$  and the rate of interest is lower  $i' < i$  than before the change. We assume that the initial year is 2000 and the change occurs in 2001.

In order to see the changes in profit opportunities of the different stages of production, we analyze the effects on the rates of ordinary interest. The ordinary rate of interest of a stage  $n$  for year  $y$  is defined as the *ex post* rate of return on investment. It is, in other words, the relative difference between the aggregate price of the products of this stage in year  $y$  and the aggregate price of the factors that have been used at the same stage,  $n$ , but bought during the *preceding* year  $(y-1)$ . In other words, the ordinary rate of interest indicates the relative profitability of a stage in a given year, and will therefore indicate whether investments tend to be made further from or closer to, the stage for final consumption. In static equilibrium, under the assumptions of the model, there is *one and only one* ordinary rate of interest:

$$i_n = \frac{I_{KG(n-1)} - I_n}{I_n} = \frac{(1-a)I_{n-1} - I_n}{I_n} = i, \quad \forall n \geq 2$$

In year 2000 and before, the ordinary rate of interest is unique ( $= i$ ). During the year 2001, the year when structure  $(C', I', i')$  replaces structure  $(C, I, i)$ , *there are as many ordinary rates of interest as there are stages of production*. The ordinary rate of interest  $\tilde{i}_n$  of a stage  $n$  ( $n \geq 2$ ) is the relative difference between the income from the production of stage  $n$  in 2001 ( $= I'_{KG(n-1)} = (1-a')I'_{n-1}$ ) and the costs of production, incurred in 2000, of the factors of stage  $n$  ( $= I_n$ ):

$$\tilde{i}_n = \frac{(1-a')I'_{n-1} - I_n}{I_n}$$

Where  $I_n$  is the investment at stage  $n$  of the initial structure  $(C, I, i)$ ,  $I'_{n-1}$  the investment at stage  $(n-1)$  of the new structure  $(C', I', i')$ , and  $a'$  the ratio of ordinary factors at each stage of the new structure. For stage 1,

$$\tilde{i}_1 = \frac{C' - I_1}{I_1}$$

The rates  $\tilde{i}_n$  are the sums of two components, the initial rate of interest  $i$  on the one hand, and a transitional rate of pure profit (or pure loss) on the other. They may be written accordingly:

$$\tilde{i}_n = i + \frac{(1-a')I'_{n-1} - (1-a)I_{n-1}}{I_n} = i + \tilde{\pi}_n$$



In order to illustrate these formulas, we consider a situation in which the rate of interest is lowered by a credit expansion. However (and here we depart from Fillieule's exposition), in turn we will see the consequences when it is revealed that the reduced rate of interest was in fact induced by a monetary expansion.

### 5.4.3 A Monetary Expansion Perceived as Increased Saving

We assume that the initial structure is  $(C = 100, I = 300, i = 12\%)$  and the final structure  $(C' = 90, I' = 310, i' = 10\%)$ . In the following table, reproduced from Fillieule (2007), we present the *ex post* originary rates of interest in year 2001, i.e. the rates between the two structures, for the first ten stages. In 2000, the economy was in a state of equilibrium, so that the rate of originary rate of interest for every stage was 12% and thus equal to  $i$ . In other words, the transitional rate of pure profit (or pure loss),  $\tilde{\pi}_n$ , is equal to 0 in equilibrium. From the table it is clear that the profit seeking entrepreneurs will want to increase investment in the stages  $n > 2$  where the originary rate of interest is larger than the initial rate of interest,  $\tilde{i}_n > i$ , and reduce investments in the first two stages where it is the other way around  $\tilde{i}_n < i$ .

Table 1: Originary rates of interest between the structures given a savings-induced monetary expansion. $(C=100, I=300, i=12\%)$ and $(C'=90, I'=310, i'=10\%)$										
Stage $n$	1	2	3	4	5	6	7	8	9	10
Rate $\tilde{i}_n(\%)$	0,8	5,63	10,7	16,01	21,58	27,41	33,52	39,92	46,63	53,67

### 5.4.4 The Downturn

Assume now that, because the rate of interest was artificially lowered, the real conditions are different from what the entrepreneurs predicted when they made their investments. We shall assume that consumption, instead of being reduced to  $C' = 90$  as in the last subsection has actually increased to  $C'' = 105$  due to the artificially lowered rate of interest. Consequently, the mechanisms examined in section 5.3 come into play so that the rate of interest is increased and rises above the initial value to  $i'' = 13\%$ . Given that the level of investment is  $I'' = 310$  when it is discovered that consumption has not increased, the result is that the late stages of

production suddenly appear to be more profitable than the early stages. This can clearly be seen in table 2 where the originary rates of interest are stated. Compared with the time references of the population, too many resources have been invested in the early stages of production, resulting in losses for the companies in these stages. Given our assumptions, we see from the table that a profit can be obtained in the first three stages, while companies in the  $n > 3$  stages will suffer losses as the originary rate is lower than the initial rate. Because of this, entrepreneurs in the early stages will want to cut back and abandon their production projects in order to invest in the earlier stages instead. This painful downturn is the necessary consequence of the credit expansion, and an important implication of the Austrian business cycle theory.

*Table 2: Originary rates of interest between the structures given a savings-induced monetary expansion. ( $C'=90$ ,  $I'=310$ ,  $i'=10\%$ ) and ( $C''=105$ ,  $I''=310$ ,  $i''=13\%$ )*

Stage $n$	1	2	3	4	5	6	7	8	9	10
Rate $\tilde{i}_n(\%)$	28,33	21,15	16,14	10,50	5,12	0,005	-4,87	-9,97	-13,91	-18,09

## 6.0 A Survey of Critiques

While the ABCT may seem intuitive and appealing at first, we cannot conclude that it is a valid explanation for the business cycle without first confronting the main critiques that have been directed towards it. Since the theory was developed about 100 years ago, it has been criticized by many, from Sraffa (1932) and Keynes (1936:328-329), to Friedman (1993), Krugman (1998), Krugman (2008) again and Caplan (2008) to mention some. Indeed, it has been questioned whether the theory is best described as a theory of the business cycle at all. As Hicks wrote, the ABCT is

a contribution which, when it was made, was out of due time. It does not belong to the theory of fluctuations, which was the centre of economists' attention in 1930; it is a fore-runner of the growth theory of more recent years. In that application we can still make something of it (Quoted in Cochran & Call, 2003:67).

Regardless of whether the theory is seen as a cycle or a growth theory, I think the critiques that I shall examine in this section are of importance.

It would surely be an enormous task to analyze the innumerable criticisms that have been put forward against the ABCT, especially during the 1930s, and evaluate these in terms of the framework developed by modern Austrians. Hence, I shall restrict this survey to the most common or, in my view, the most interesting and problematic objections to the theory. Austrian responses will also be considered. I will divide this chapter into seven sections, beginning with the most frequent objection to the theory, namely that the actors in the model do not have rational expectations. Thereafter, I will move on to various other criticisms that I regard as more damaging to the theory, including some critique directed towards the capital theory. I will end with some possible objections to the Austrian methodology in general.

### 6.1 *Rational expectations*

According to Sørensen and Whitta-Jacobsen, the rational expectations hypothesis states that “*economic agents do not make systematic forecast errors*” (Sørensen, 2005:631) and that the *Policy Ineffectiveness Proposition* says that “*systematic demand management policies cannot influence real output and employment when expectations are rational*” (Sørensen, 2005:635). Clearly, this is a potential problem for the theory examined here, since the story in essence is about a policy-induced falsification of market signals that end up having real effects. Indeed,

the ABCT has been refuted on this ground by several authors<sup>11</sup>. For example, Caplan states that:

The objection is simple: Given that interest rates are artificially and unsustainably low, why would any businessman make his profitability calculations based on the assumption that the low interest rates will prevail indefinitely? No, what would happen is that entrepreneurs would realize that interest rates are only temporarily low, and take this into account (Caplan, 2008).

In other words, the apparent problem is that the entrepreneurial mistake of malinvesting resources based on an artificially low rate of interest may suggest that the entrepreneurs are acting irrationally. At first, this makes the ABCT look very naïve, but the counter-arguments made by the Austrians, in particular by Block (2001), are convincing when it comes to explaining how the malinvestments may come about even if entrepreneurs are fully rational. We shall look at these explanations in the current section.

The first reason why the mechanisms of the ABCT may come about even if rational expectations are assumed is that entrepreneurs are not assumed to have perfect knowledge in the Austrian framework. As noted by Garrison (2001:26) the underlying assumptions are that the entrepreneurs do not know the condition of the real economy, but rather respond to monetary signals, and that these signals tend to keep the entrepreneurial decisions in line with the underlying realities. He further states that “these two assumptions do not allow us to categorize the Austrians’ treatment of expectations as static, adaptive, or rational” (Garrison, 2001:26). Thus neither in real life, nor in the Austrian model do the entrepreneurs know and act according to the ABCT. If the ABCT was correct and widely accepted, rational entrepreneurs would take into account that a monetary expansion unsupported by saving necessarily would be followed by a downturn before they made their investments. However, since the ABCT hardly is well-known to the public, the theory cannot “refute itself” in this way.

Secondly, even if the ABCT was correct and accepted, and this was known to all entrepreneurs, it would hardly be straightforward for investors to determine when the market rate of interest was lower than the natural rate. As was discussed above, the market rate of interest may or may not drop simultaneously as the natural rate. Thus, it is not sufficient for the entrepreneur to interpret a certain rate of interest as simply “low” or “high”. Rather, the interpretation is between the observable market rate and the theoretically constructed natural rate of interest. Even the fully rational entrepreneur is not able to know for sure whether the

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<sup>11</sup> See e.g. Wagner (1999), Cowen (1997) and Hummel (1979).

market rate is in fact below the natural rate or not. This point is made particularly clear by the fact that a credit expansion may come about by an increase in the natural rate, if the central bank simply maintains the market rate at the same level. Hence, an increase in the productivity of capital, and in the rate of depreciation of capital or a decrease in the rate of saving may cause the unsustainable boom, if the central bank fails to respond by increasing the market rate of interest to an equivalent extent. Thus, the rational entrepreneur, facing a distorted signal, will find it very difficult to determine whether the rate of interest is in fact low or not.

Thirdly, as long as not all entrepreneurs have perfect knowledge, it will be profitable for entrepreneurs to increase investments in response to a monetary expansion, even if these investments will lead to losses once the monetary expansion comes to a halt. Thus, we have a situation in which individual rationality may lead to collective irrationality. Caplan objects to this, by stating that

the rational response to artificially low interest rates is to (a) make investments which will be profitable even though interest rates will later rise, and (b) refrain from making investments which would be profitable only on the assumption that interest rates will not later rise. If entrepreneurs followed this rule, then there would be no tendency for policy reversals to produce malinvestments (Caplan, 2008).

This is true given that the rational actors can know whether interest rates are "high" or "low". However, as noted above, this is hardly straightforward. Thus, it may well be rational for an entrepreneur to respond to the signal of low interest by increased investment, and then leave the market before the boom turns into bust.

## 6.2 Capital Theory

Considering the complexity of capital theory, it goes without saying that no more than the surface of what *may* be problematic can be examined. I will comment on two issues: First, the *Cambridge capital controversy* and in particular Samuelson's (1966) contribution regarding *reswitching*. Second, the concept of longer and shorter production processes in general, which is essential to the Austrian capital theory.

### 6.2.1 Reswitching and the Cambridge Capital Controversy

The Cambridge capital controversy took place in the 1960's and was a debate between "neoclassicals" from *Massachusetts Institute of Technology* (MIT) in Cambridge, Massachusetts on the one side, and the "neo-ricardian" challengers from the *University of Cambridge* in England on the other side. Since this was one of the main debates over capital and interest in the post-war era and also included a rejection of Böhm-Bawerk's capital theory, a presentation of some Austrian responses is also called for.

The neoclassical theory identify interest as the marginal value added by productive capital; if the rate of interest is higher than the rate of return on capital, it will not be profitable for investors to invest in capital goods, and vice versa. From the Cambridge (UK) perspective, neoclassical capital and interest theory erred in this explanation of interest as an income determined through the interplay of consequent supply and demand conditions. These critics therefore, following Sraffa (1960), "argued for a theory in which the objective conditions of production determine economic events, with virtually no role assigned to consumer demand" (Kirzner 5-6). The critics essentially wanted to "reverse the marginalist revolution and return to the classical perspective" (Kirzner 5).

In Kirzner's view, the controversy was incomplete because it left out the Austrian theory of interest. While the Cambridge (UK) perspective advocated a return to the classical objective explanation of interest rates, the neoclassical supply and demand position incorporated subjective and objective explanations. As was explained in subsection 4.3.1, the Austrian theory of interest rates is subjective, completely determined by consumer valuations or, to be more specific, by time preferences. In other words, "Mises theory depends, far more radically than does the mainstream neoclassical view, upon the key Mengerian insight (that incomes reflect consumer evaluation of the productive contributions of resources)" (Kirzner, 1996:6). For this reason, it is claimed that the Austrian theory of interest rates hardly could be rejected in the Cambridge controversy, since the Austrian theory is essentially different from the neoclassical position (Kirzner, 1996:6).

Furthermore, according to Kirzner, it was the reswitching and capital reversal paradoxes which cast the deepest shadow upon the mainstream neoclassical theory of distribution (Kirzner, 1996:7). Indeed, Samuelson's conceding article *A Summing Up* (1966) is devoted to this issue. Samuelson opens by claiming that

The phenomenon of switching back at a very low interest rate to a set of techniques that had seemed viable only at a very high interest rate involved more than esoteric technicalities. It shows

that the simple tale told by Jevons, Böhm-Bawerk, Wicksell, and other neoclassical writers [...] cannot be universally valid (Samuelson, 1966:568).

What does the phenomenon of reswitching imply? Essentially it means that a reduction in the rate of interest will not necessarily shorten the structure of production. As Samuelson (1966:569-573) shows, a certain production process, *A*, may be more profitable than another, *B*, at high rates of interest and less profitable than *B* at a mediocre level of interest. However, it is theoretically possible for the process *A* to again yield a higher level of profits than *B* as the level of interest drops further. It is therefore not possible, Samuelson concludes, to unambiguously refer to one process as “longer” or more “roundabout” than another.

This has been characterized as “the final nail in the coffin” for Austrian capital theory (Quoted in Murphy, 2003). Regarding this, several Austrian explanations may be identified, but for the sake of brevity I shall focus on the one given by Kirzner (1996). First, the response from Kirzner relates to the interest rate theory. Since the neoclassicals see interest as the price of capital, the fact that *less* capital may be demanded when the rate of interest decreases is a problem for the neoclassical theory, but not necessarily for the subjective interest theory of the Austrian School (Kirzner, 1996:8). Although Kirzner concedes that the time-preference theory must also confront the reswitching issue, he claims that there is a fundamental problem with one of Samuelson’s premises. What Kirzner objects to, is the premise that “each technique of production involves a simple, unidimensional ‘quantity’ of time, such that different techniques can be unambiguously ‘objectively’ ranked as involving greater or lesser quantities of time (or waiting)” (1996:9). In other words, he maintains that the reswitching problem should not make us conclude that a change in the rate of interest may bring about a more or less time consuming process, but rather that we are simply not permitted to believe that one technique involves unambiguously less waiting than another, based on complex waiting requirements for different techniques (1996:10). In conclusion therefore, Kirzner rejects that the reswitching case is problematic for the Austrian theory of capital since “a technique of production calls for a specific pattern of dating for its inputs [...] Different techniques involve different patterns of prospective delay; that is all” (1996:10). Hence, according to the Austrian School, Samuelson’s critique is not damning at all. Rather it is a consequence first of a misunderstanding of what the point of the Austrian capital theory really is, namely that “if you give the entrepreneur the same amount of labor and raw materials, he can produce a greater output the more time he is given to work with” (Murphy,

2003). This does not mean that a lower rate of interest never can lead to a shortening of some production processes.

### 6.2.2 Problems of Austrian Capital Theory

Another general critique of the ABCT that relates to the way the capital theory of the economy is modeled and assumed to function in the Austrian scheme. As an example, the entire concept of “earlier” and “later” stages of production may certainly be questioned. Although it can make sense to think of oil drilling as an activity in the early stage category of mining, no oil production is today conducted without the use of complicated and expensive equipment that surely should be considered as the output of a later stage of production than oil. Thus, a real chain of production goods would really have to be stretched back to the beginning of time when the first capital good was produced. This is certainly a problematic concept. As Nicholas Kaldor says in one of his critiques of Hayek, “the main principle of this theory that the accumulation of capital involves a ‘lengthening’ of the investment period, is false and unwarranted; and, moreover, the meaning of the investment period concept itself is subject to grave doubts” (Kaldor, 1939:41).

Still, the theory may be more plausible if the structure of production is defined in a different way. Admittedly, many Austrians are critical to Garrison’s Hayekian triangle and hence the graphical explanation of the ABCT that has been relied upon here.<sup>12</sup> Barnett II and Block have for example suggested that “a far better term to use than ‘long-term’ projects is ‘interest-rate-sensitive-goods’” (Barnett II & Block, 2006a:53). Hence, this is perhaps not a damning point, since the importance of the model is to account for the time element, the heterogeneity and the specificity of capital goods. Still, the fact that capital theory has dropped out of mainstream textbooks may be a telling sign that the necessary complexity of such a theory makes it difficult to produce a coherent theory of the capital structure. Although the Austrian capital theory is interesting and brings time and intermediate goods into the analysis in a neat way, this cannot prevent any serious student of the theory to be left puzzled when it comes to important aspects of the capital structure of the economy.

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<sup>12</sup> For an Austrian critique of the Hayekian triangle, see (Barnett II & Block, 2006b)



### 6.3 *The Necessity of Recession*

According to the ABCT, any credit expansion that causes the market rate of interest to drop below the natural rate will necessarily lead to malinvestments and a painful readjustment process. In his critique of the ABCT, Tullock has questioned this claim,

I would not deny that inflation is ‘wicked’, but its main costs are the reductions in efficiency of the economy while the inflation is going on. It is possible to get out of inflation without a depression. In fact, the more severe the inflation, the easier (Tullock, 1988:149).

Essential to the claim regarding the “necessity of recession” is that the credit expansion eventually must come to a halt. Mises explains this as the “flight into real values” which is characterized by the fact that inflation is equivalent with a decrease in the purchasing power of money, and this restricts the population’s propensity to hold cash. The reason is that the expected prices increase so that the values of present money are eventually discounted to such an extent that no one is willing to sell “real goods” for a price that someone is able to offer. Eventually, Mises explains, “the monetary system breaks down; all transactions in the money concerned cease, a panic makes its purchasing power vanish altogether. People run either to barter or to the use of another kind of money” (Mises, 1998:424).

Hence, a continuous monetary expansion will eventually lead to increased expectations about higher prices to such an extent that no one has enough money to pay for the goods. This may well be true for hyperinflations such as Mises experienced in Vienna after the First World War, but it hardly convinces anyone that a low and steady increase in the money supply necessarily will lead to a crisis. Why is not an increase in the supply of money, in an increasingly productive society, preferable in order to keep prices stable? The Austrian explanation here is related to rational expectations. As Huerta de Soto states,

a policy which prevents an upsurge in productivity from reducing the price of consumer goods and services inevitably generates expectations on the maintenance of the price level in the future. These expectations invariably lead to an artificial lengthening of the productive structure, a modification bound to reverse in the form of a recession (Huerta de Soto, 2006:428).

It seems as if this critique in the end is a question of definitions. As was noted in the introduction, the Austrian definition of depressions is somewhat different from the conventional one. Since Austrians define slumps that are not caused by the preceding booms as fluctuations rather than part of the cycle, the Austrian claim can be justified (Batemarco,

1994:221). Thus, the more narrow Austrian definition of boom and bust may possibly account for all recessions as defined by the Austrian School, although it cannot explain all busts that occur according to the conventional view of inflations.

#### **6.4 “The ABCT is Outdated”**

As explained in section 2, the Austrian movement was practically non-existing at the advent of World War 2. The ABCT had been at the forefront of business cycle research prior to the Keynesian revolution, but following Hayek’s *Pure Theory of Capital* (1950[1941]), hardly any theoretical advancement was made in the Austrian cycle theory. This lack of development has continued to this day, even though there has been an increase in the interest of the theory and in the number of contributions during the previous three decades.

The lack of development has made certain critics question whether the ABCT is able to describe the mechanisms of a modern economy. As Wager notes, the gold standards are replaced by fiat money, governments have grown extensively and the channels through which credit markets work are more complicated than the ABCT takes into account. A credit expansion might take the form of booms in real estate or securities markets, rather than as a general lengthening in the structure of production (Wagner, 2005:84-85).

The Austrian response to this is ambiguous. On the one hand, Boettke has conceded this problem, as he has stated in a podcast that the theory, at least the applicability of it, must be modified to take such things as consumer credit into account (Boettke, 2007). Clearly, consumption loans have risen to levels that were unimaginable in the decades preceding the Second World War and this may indicate that more work in this direction is necessary for the ABCT to advance. On the other hand, Austrian students of Rothbard tend to reject such claims for two reasons. Firstly, although for example Block agrees that institutions have changed greatly since the 1930’s, he maintains that praxeological theories, such as the ABCT are “timeless and applicable to the real world at any epoch” (Block, 2001:64). Secondly, modern Austrians do not necessarily agree that the ABCT has been underdeveloped after WWII, but argue instead that the work of Rothbard, Garrison and other modern Austrians has improved the theory in important respects.

## 6.5 *The Cycle as a Random Walk*

It has been argued by Tullock (1987:74) that the ABCT is invalid because the results of statistical tests have detected random walks rather than a business cycle. This controversy can be explained by referring back to our methodological discussion of section 3.3. According to Mises,

Neither the connection between boom and bust nor the cyclical change of business conditions is a fact that can be established independent of theory. Only theory, business cycle theory, permits us to detect the wavy outline of a cycle in the tangled confusion of events (Mises, 2006[1928]:103).

Thus, Austrians do not accept that graphs of historical periods can disprove the ABCT, because empirical material always consists of complex events in which it is concealed whether the economic forces are amplifying or undermining the theories. This does of course not mean that one should not look for cycles or waves in the data, but whether such a thing can be observed or not can, according to Austrians, neither prove nor disprove that the theory is false.

## 6.6 *The “Keynes Problem”*

In Butos’ (2001) expositions of Garrison’s *Time and money*, he brings up the “Keynes problem” in relation to the theory. As contemporary macroeconomic theories to a large extent is elaborations and developments of Keynes’ theories, or reactions to this, an ever present question seems to be how Keynes relates to the specific theory. The “Keynes problem” is indeed present when it comes to the Austrian Business Cycle Theory as well. After all, it was in the decade of the Keynesian revolution that the ABCT lost most of its acceptance in the economics profession. How do Garrison, in his presentation of the ABCT deal with Keynes in the 21<sup>st</sup> century? According to Butos, “although Garrison only intimates this, the thrust of his argument suggests that the development of labor-based macroeconomics since the 1930s is either irrelevant or redundant to the new vision” (Butos, 2001:6). Hence, a justification for important elements of the ABCT in a sense implies a general critique of Keynesianism and Keynes’ rejection of the “classical theories”, of which the Austrian School is a part. Such critiques exist<sup>13</sup>, but an examination of the differences between Keynes and the Austrians

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<sup>13</sup> See e.g. Hazlitt (1959), Rothbard (2000[1963]:37-54)

would take us far away from issues that relate only to the ABCT. Still, we shall briefly comment on a couple of the problems that *the General Theory* poses for the ABCT, namely the critique of the market for loanable funds and the paradox of thrift.

Keynes famous paradox of thrift is essentially a claim that the old maxim of the virtue of thriftiness no longer holds on the aggregate level in a modern economy with division of labor, in which one man's income depends on another man's spending. As Keynes states it, "every such attempt to save more by reducing consumption will so affect incomes that the attempt necessarily defeats itself" (Keynes, 1936:84).

Furthermore, as mentioned above, the market for loanable funds appeared as the only diagram in Keynes' revolutionary book. Regarding this theory, he states that

the classical theory of the rate of interest seems to suppose that, if the demand curve for capital shifts or if the curve relating the rate of interest to the amounts saved out of a given income shifts or if both these curves shift, the new rate of interest will be given by the point of intersection of the new positions of the two curves. But this is a nonsense theory. For the assumption that income is constant is inconsistent with the assumption that these two curves can shift, then, in general, income will change; with the result that the whole schematism based on the assumption of a given income breaks down (Keynes, 1936:179).

The implication of this is essentially that it is false to say that the rate of interest is determined by the supply of, and the demand for loanable funds. In other words, it is not at all true that an increase in savings necessarily has a positive effect on investment. The consequences for the ABCT as presented here are obviously fatal. If the market for loanable funds is "a nonsense theory", we can no longer accept that the link between the market for loanable funds and the PPF in figure 5 is the way it has been assumed hitherto. As Garrison explains, the paradox of thrift would then imply that an increase in savings would move the economy inside the sustainable PPF, away from the optimal allocation. The reduction in consumption would no longer be replaced by an increase in investment (Garrison, 2001:163).

These are complicated matters, and I shall not attempt to present a full Austrian justification for why the ABCT nevertheless is a valid theory here. However, as the validity of the ABCT is at stake in an important way, it is also necessary to briefly hint at some Austrian explanations. Firstly, the ABCT, at least in the hands of Garrison, focuses on the medium run. Since the paradox of thrift relates to the short run (Blachard, 2003:60), the concept of "saving-up-for-something" (Garrison, 2001:40) may be justified. Even though it is correct, as Keynes maintains, that a decision to save today is not necessarily a decision to consume tomorrow, saving is still a decision to consume sometime later in the future. Secondly, as the Austrian

Robert Murphy (2009) points out, the paradox of thrift is based on an extreme assumption which, if it was kept in the conventional IS-LM model, would have left little room for expansionary policy. This implicit assumption is namely that the marginal propensity to consume is equal to 1, i.e., that a reduction in income by 1 monetary unit will decrease consumption by an equal amount. However, if the marginal propensity to consume rather is somewhere between 0 and 1, a reduction in consumption by person A equal to 1 m.u. will not induce person B, whose goods person A used to buy for 1 m.u., to reduce his consumption by as much as his income has been reduced. Rather, person B will respond to the lower income *partly* by reducing his consumption and *partly* by reducing his savings. Thirdly, a common Austrian claim against Keynes (and other macroeconomic theories) is that they fail in important ways due to the lack of a theory of capital. This is also the case when it comes to the paradox of thrift. As Garrison explains, once the *the* labor market is considered, rather than various labor markets for the different stages in the production structure, the “kinds of relative movements [...] that are essential for adjusting the economy to an intertemporal preference change are hopelessly obscured” (Garrison, 2001:163).

The important point here is that the Austrians claim that there is a difference between investment when it is supported by saving and when it is based on an artificial credit expansion. In the former case, the investments made will be sustainable and not lead to any downturn, but in the latter case the Austrian business cycle must come about for the reasons explained in chapter 5.

## 6.7 Methodological Controversies

The final potential problem I shall present regarding the ABCT deals not with the theory directly, but rather with the way the theory has been derived, and in that sense with the whole Austrian methodology. In section 3.2 and 3.3 it was explained how the Austrian theory, praxeology, is derived from the axiom that humans act, and that the Austrian School rejects both the use of mathematics and the falsification of theoretical relations by the use of empiricism. From a mainstream point of view, this makes the ABCT problematic on several accounts.

First, applying logic as the single tool in order to derive a coherent system of complex economic mechanisms is not a method free from problems. The main issue with praxeology from a “mainstream point of view” is that a logical chain of reasoning always may involve

mistakes, and increasingly so as the number of links in the chain increase. It is true, as Austrians maintain, that mathematics is an example of how logic may be used to build such a system, but in contrast to mathematical reasoning, verbal praxeological propositions cannot be proved in any simple way.

Secondly, the fact that Austrians relegate the task of empiricism to “illustrate” rather than to falsify the logical propositions, Austrian economists will never concede that the logical relations of the ABCT are wrong based on statistical tests. For the positivist dominated mainstream, this view may certainly come about as naïve. Although economic propositions cannot be isolated from the complex reality, the conclusion that history can tell us nothing about economic relations seems too extreme.

## **7.0 Answers to Three Questions:**

### **The Crisis of 2008 and Policy Implications of the ABCT**

After having analyzed the Austrian business cycle theory, it is time to provide an answer to the three introductory questions. In the present chapter, each section will be dedicated to providing an answer. Firstly, the ABCT is discussed in relation to the economic crisis of 2008. Secondly, regarding the political implications of the ABCT, the two modern Austrian viewpoints are presented and contrasted. Thirdly, in the last section of the chapter, some thoughts on the validity of the ABCT are discussed.

#### ***7.1 The Crisis of 2008: The First Question***

What is the Austrian explanation for, and solution to, the ongoing financial crisis? A large scale econometric analysis would clearly be necessary in order to answer this first introductory question in a satisfactory way. Unfortunately, this task cannot be performed in the present thesis. However, I will restrict myself to comment on the ABCT in relation to some macroeconomic time series in order to get some idea of the relevance of the theory. First, I will investigate how the ABCT fit with the data by comparing the market rate of interest with proxies of the natural rate. Second, I will briefly evaluate the actions that have been taken by central banks and governments in response to the crisis in light of the ABCT. This will provide us with the opportunity to investigate how the crisis should have been coped with from an Austrian viewpoint.

##### **7.1.1 The Recession of 2008**

Given the fact that the ABCT theory is a monetary theory, it should come as no surprise that the role of the central bank has an important part to play in the Austrian explanation for the current economic distress. Indeed, many Austrian economists claim that “Yes, Greenspan Did It” (Karlsson, 2008), (Murphy, 2008) and (Shostak, 2009). This does of course not mean that Austrians hold the American central bank solely responsible for the recession. However, since it is arguably *the* main explanation, I will in this subsection mainly focus on the role of the monetary policy in the United States during the last decade.

In order to examine the extent to which the ABCT fits the data of the 2008 recession, it is necessary to investigate how a monetary expansion affects the different industries in the

capital structure of the economy. However, this task is by no means straightforward. Since the Austrians have been relatively few in number and, as we saw in section 3.3, generally skeptical to the usefulness of econometrics, the amount of such work that has focused on the ABCT is quite sparse<sup>14</sup>. Adding further to the complication is the fact that the mechanisms of the Austrian business cycle generally operate on a lower level of aggregation than the conventional macroeconomic data take into account. Rather, Austrians argue that the ABCT is a theory about what is missed when aggregates such as the GDP, the CPI or the PPI are considered, namely the differences in relative prices, levels of employment and production *within* the different sectors of the economy (Callahan & Garrison, 2003:68). Furthermore, as has already been noted, it is of course problematic to classify a specific industry as an early or as a late stage sector. Even though for example mining may be seen as an “early” stage of production, it cannot be ignored that, during the production process, modern mining companies obviously use factors that have been manufactured in a “later” stage of production. Nevertheless, for the sake of brevity and simplicity, I shall constrain my task to investigating the relationship between some conventional macroeconomic variables, which the ABCT should at least be able to say *something* about.

The data for the 2008 recession in figure 11 seems, at first glance, to fit the ABCT well: The lowering of interest rates that started in 2000, and was intensified after the terror attacks of 9/11, helped fueling the boom as the Fed’s rate was pushed down to 1 percent in 2003. The credit expansion had to come to a halt sooner or later, something that started to happen as the Fed increased rates from 1% to 5.25 % between the summer of 2004 and the summer of 2006. This sudden tightening of monetary policy was followed, with a lag, by a sharp increase in unemployment during 2008 and 2009.

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<sup>14</sup> But there are some, such as: (Keeler, 2001), (Bismans & Mougeot, 2009), (Butos, 1993), (Callahan & Garrison, 2003) and (Mulligan, 2006).



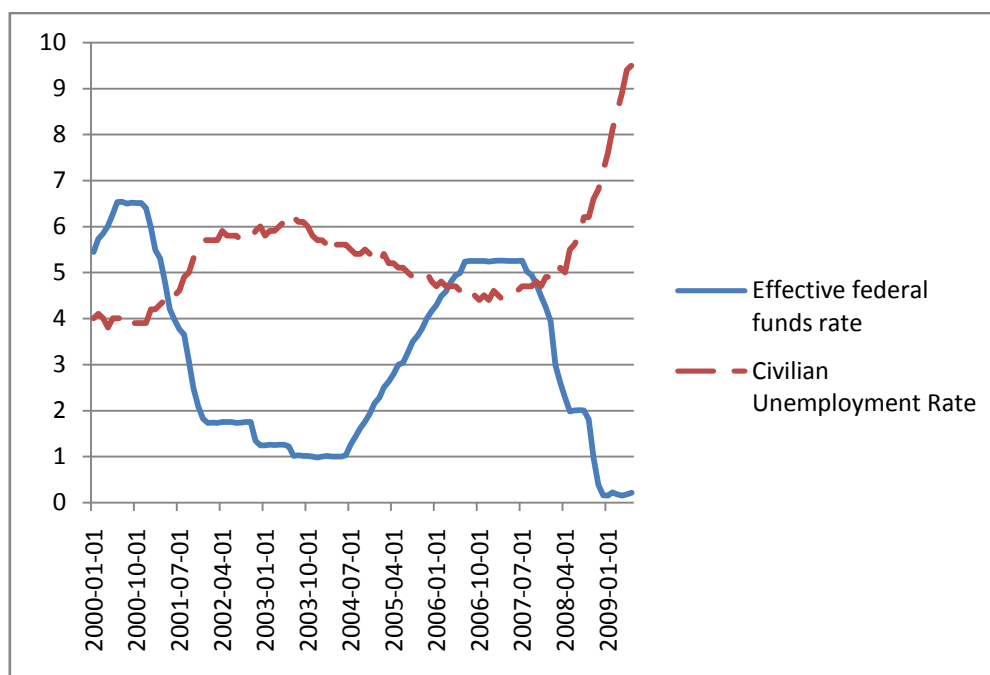


Figure 11: The rate of interest and the rate of unemployment in percentage points for the United States.

If the ABCT is correct, the credit expansion lasting from 2000 to 2004 falsely signaled to the entrepreneurs that consumption had decreased, so that new, long-term investment projects were profitable as factors of production had been released from the later stages of production. However, as the rate of interest was increased again during the following two years it was revealed through the market mechanisms that many of the investment projects launched during the credit expansion were not profitable given the higher rate of interest. As a result, companies went bankrupt and workers were laid off.

Although the Austrian story is at least not falsified by the variables looked at so far, this does of course not mean that the ABCT necessarily provides a good explanation for the current crisis. I have emphasized throughout the article, that what is important is not whether the nominal rate of interest is high or low, but rather whether the real rate of interest is high or low compared to the theoretical natural rate. Although this is impossible to measure, I have followed Bismans and Mougeot (2009:9) in attempting to illustrate the natural rate by a proxy in the following graph, namely by the difference between the 10-year maturity Treasury bond rate (GS10)<sup>15</sup> and the 3-month market rate (TB3MS). This is done for the last two decades in

<sup>15</sup> All data is provided by the economic research pages of the Federal Reserve Bank of St. Louis (<http://www.stlouisfed.org/>). I will write the series ID in brackets for convenience.

the United States, along with the real value of the effective federal funds rate (FEDFUNDS) and the civilian unemployment rate (UNRATE).

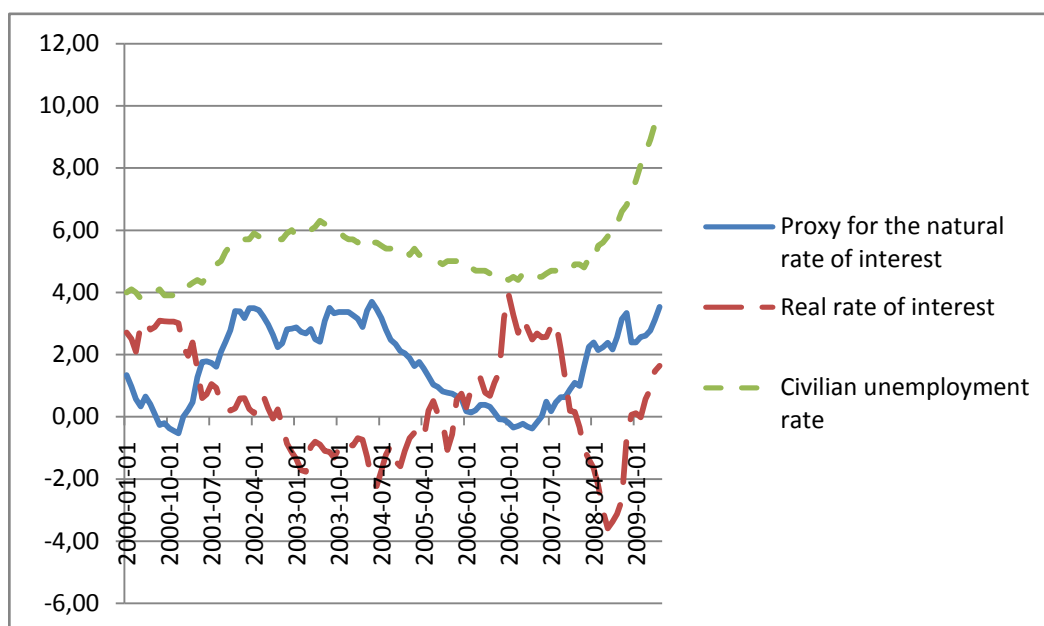


Figure 12: A proxy for the spread between the natural and the real rate of interest in percentage points for the United States.

Furthermore, I have taken Wicksell's suggestion from 1898 seriously. He writes that

the current level of commodity prices provides a reliable test of the agreement or diversion of the two rates. The procedure should rather be simply as follows: *So long as prices remain unaltered the banks' rate of interest is to remain unaltered. If prices rise, the rate of interest is to be raised; and if prices fall, the rate of interest is to be lowered; and the rate of interest is henceforth to be maintained at its new level until a further movement of prices calls for a further change in one direction or the other* (Wicksell, 1962:189)

Thus, by plotting the yearly percentage change in CPI (CPIAUCNS) against the nominal effective federal funds rate, we obtain another figure from which to determine whether the rate of interest in the United States has been above or below the natural rate.

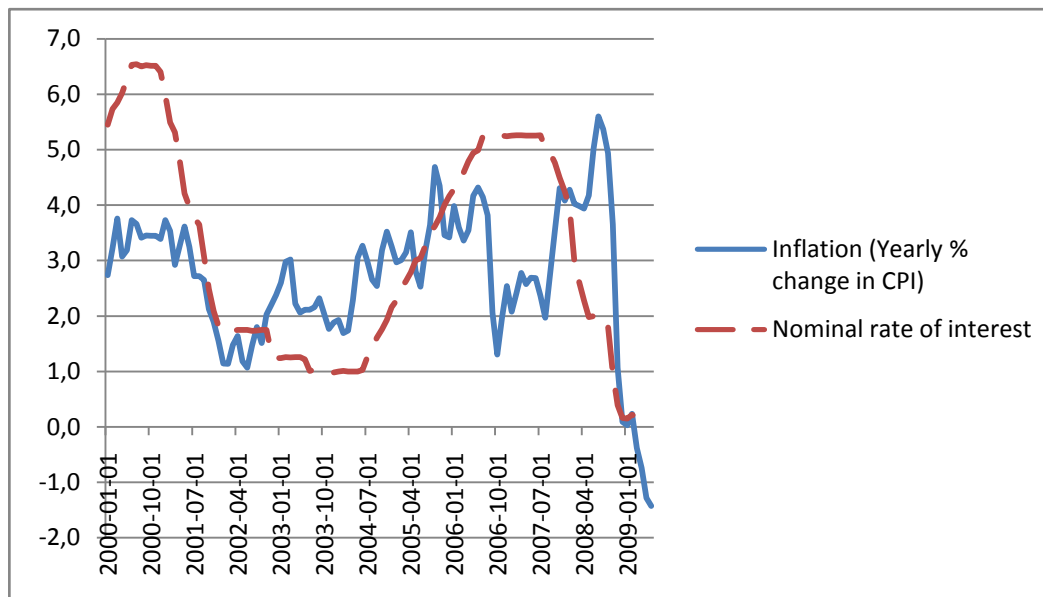
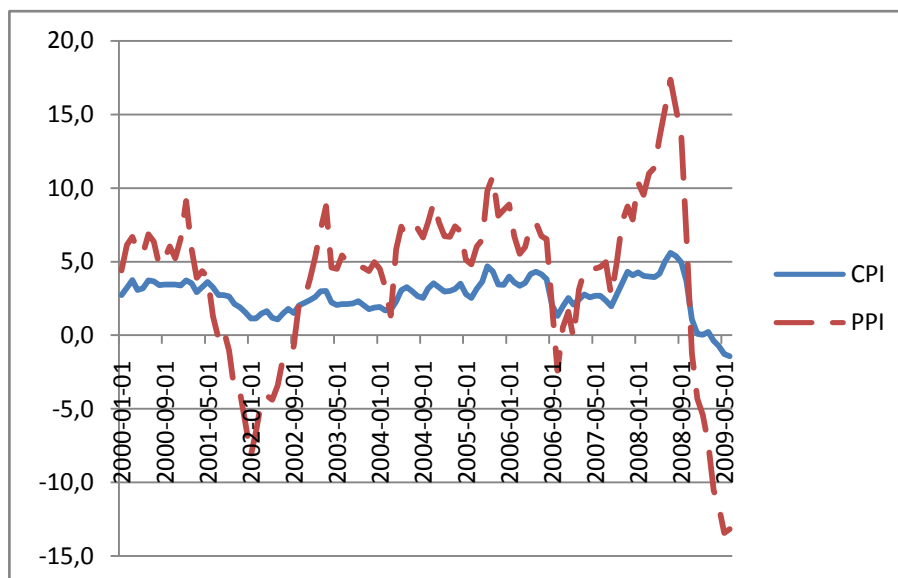


Figure 13: The nominal rate of interest compared with the yearly percentage change in the consumer price index in the United States.

The two figures tell a mutually consistent story. Between 2002 and 2005, the Federal Reserve kept the market rate of interest below the natural rate, and caused a boom which can be illustrated by the steady decline in the rate of unemployment between 2003 and 2007 in figure 12. During this period, according to the ABCT, the entrepreneurs were malinvesting resources due to the perverted signal of the consumers' intertemporal preferences. At this point therefore, the recession was inevitable. Also inevitable according to the theory, was the monetary contraction that took place mainly through 2005 as the market rate of interest was pushed above the natural rate of interest.

Hence, at the surface, the theory seems to explain the data very well. An interesting question is whether this will continue to hold true as we examine data on a lower level of aggregation. According to the ABCT, the expansion period, e.g. 11<sup>th</sup> of September 2001 to the end of 2005, should be a period in which the change in the price of producers goods increased relative to change in the price of consumer goods, i.e. we expect an increase in  $\frac{\% \dot{PPI}}{\% \dot{CPI}}$ , where the dots indicate that we are measuring percentage change. Furthermore, the initiation of the recession, taking place in the summer of 2008, should be signaled by a decrease in the same ratio. The graphs are shown in figure 14.



*Figure 14: A comparison between the consumers price index and the producers price index in the United States.*

The boom period is, quite as expected, characterized by a sharp increase in the ratio throughout 2002 and also during the first part of 2003. However, this initial increase may perhaps be explained just as much by a low level of PPI following the dot.com recession, as by the boom following the low rates of interest in the beginning of the millennium. Furthermore, the increase in the ratio flattens out during 2003, and stays fairly stable during the rest of the expansion period. Thus, the results are partly as expected. The recession period, starting in mid-2008 fits even better with what the theory would predict. Although the CPI drops quite substantially, this is all but modest compared with the extreme drop in the PPI. Clearly this is consistent with the theory, which would explain this drop with the fact that the true status of the malinvested capital goods has finally been revealed.

However, one should not be too encouraged by these results, but rather recall the problems that were mentioned at the beginning of this section. We should indeed be cautious to draw any conclusion from this empirical investigation. A reliable inquiry of such a kind would need to provide some solutions to the problems mentioned, and in addition use sophisticated econometric techniques. Furthermore, there are many factors, other than that of the central bank, which should be taken into consideration. The Austrian theory may be applicable in explaining other causes of the crisis as well, although in a less obvious way. However, a full analysis of the ABCT in relation to the current financial crisis would be a suitable topic for an entire thesis, rather than a subtitle of the present one.

### 7.1.2 On the Handling of the Crisis

There is no doubt that governments all over the world have responded quickly and extensively to the crisis. In the United States, banks and car companies have been bailed out, the federal funds target rate has been lowered to a range between 0 and 0.25 %, huge amounts of credit has been injected into the financial markets and official guarantees and public stimulus packages have been constructed in order to reestablish confidence and increase consumer demand. In general, monetary and fiscal policies have been expansive. These governmental actions have obviously had supporters and opponents, and Austrian economists have, as far as I know, without exception been among the latter. The Austrian School has always been associated with laissez-faire positions and with strong links to the libertarian movement and ideology. Even though some may argue that the Austrian School's criticism of the government's actions is based on an ideological bias rather than on economic reasoning, it is still true that the ABCT- if it is correct- is an argument *against* interventionist and expansionary policies in order to ease the pain of the recession.

If we assume that the expansionary policies of the Fed was the *only* reason for the current economic downturn, the ABCT would ascribe the entire recession to the fact that resources have been invested according to the false signal of the market rate of interest. This would for example mean that entrepreneurs had invested too much in the production of goods that it takes a longer time to complete, i.e. the production of goods whose profitability is more dependent on the rate of interest, even though this was at odds with the preferences of the consumers who were not ready to undertake such time-consuming investments. In this situation, the malinvested resources would need to be liquidated. However, the more specific the capital goods are the slower and more painful the process is. If the consumer's wanted more footballs and bicycles, but the entrepreneurs have invested in oil platforms and car production, this is a mistake that cannot be resolved without losses. As the Austrians argue, this can hardly be solved by the injection of more credit, which will incite more investment in the industries that are further from consumption. Rather, such an action would only aggravate the problem.

There is of course no reason to believe that the ABCT is the *only* explanation for the current downturn. But there can be little doubt that the more valid the theory is, the more important would it be for the malinvestments to be liquidated, rather than for the authorities to attempt to avoid the recession. The liquidation position would furthermore be strengthened to the extent that other explanations for the crisis may be consistent with the ABCT. The American real estate market and the auto industry may serve as examples here. To the extent

that these sectors have been expanding (or not contracting) for other reasons than the expansionary monetary policy, the Austrian analysis may still shed some light upon this situation. In other words, a housing bubble caused by Fannie Mae and Freddie Mac would still be a source of malinvestment as resources were used in the production of homes and building equipment, rather than in the production of consumer goods that the real market was more in demand for. Hence, the ABCT could easily be altered to take into account a more specific kind of malinvestment, rather than the central bank, system-wide type that has been presented here.

Would not the Austrian liquidation solution have had disastrous consequences if it had been pursued during the winter of 2008/2009? There seems to be little doubt that the answer to this is yes. However, the Austrians claim that at that point, the recession was inevitable and that a postponement of the bust by a further expansionary policy would just prevent the market process from performing the painful, but necessary liquidation operations. Thus, Austrians do not see the expansionary government action that has been taken as a safe path through the turmoil, but rather as an inflationary “easy way out” which has been partly caused by political pressure and which in turn will lead to further mal- and overinvestments.

## ***7.2 Political Implications of the ABCT: The Second Question***

In this section we shall investigate the policy recommendations of Austrian economics, in order to provide an answer to the second introductory question. Consistent with the ABCT, the main point for Austrians is to restrict inflation in order to ensure that the price signals are not distorted. As Hayek wrote,

The pressure for more and cheaper money is an ever-present political force which monetary authorities have never been able to resist, unless they were in a position credibly to point to an absolute obstacle which made it impossible for them to meet such demands (Hayek, 2007:15).

This led him to argue that the government’s monopoly of a currency due to legal tender laws should be replaced with competition between different monies so that consumers in every country could choose which currency to use anywhere. Hayek’s claim was that this would restrict the ability of governments to inflate, as consumers would abandon any depreciating currency (Hayek, 2007:19).

For contemporary Austrians, the aim is to preserve monetary equilibrium, i.e. to ensure that the market rate of interest is not distorted from the natural rate. As with most other

issues, it is consensus among Austrians that a centralized institution, such as the central bank, is incapable of performing this task satisfactory. They argue therefore that the central bank should be abolished and that the task of determining the money supply should be left to the market forces. However, Austrian economists are split in two over the question of what kind of regime that should replace the central bank. On the one hand, followers of Rothbard argue that a 100 percent reserve gold standard is the only system that can preserve monetary equilibrium. On the other hand, many Austrians have come to embrace the theory of free banking, first developed by White (1984) and Selgin (1988). For an overview, we can illustrate the Austrian viewpoints compared with the mainstream in the following 2x2 matrix. As can be seen, the main distinction between Austrians and most other economists is that Austrians argue for the abolishment of the central bank. Hence, the Austrian position is once again a heterodox one when it comes to monetary policy, as mainstream debates hardly revolve around the question of which system that may replace the central bank. Since the central banks of developed countries are well-established institutions which possess some of the most important monetary policy tools of the economy, the debate is rather about how these tools should be used.

	<i>Free-Banking School</i>	<i>Central-Banking School</i>
<i>Banking School</i> (fractional reserve)	Most nineteenth-century Banking-School theorists. Austrian School: White, Selgin	The mainstream: Keynesians and most twentieth-century monetarists.
<i>Currency School</i> (100 percent reserve ratio)	Cernuschi, Hübner, Michaelis Austrian School: Rothbard, Huerta de Soto, Salerno, Hoppe, Hülsmann, Mises Hayek (not consistently)	Proposal made by the Chicago School in the 1930s. Maurice Allais

Table 3: An overview of dividing lines regarding monetary regimes (Huerta de Soto, 2006:645).

In this section, I will analyze the two “free-banking” positions of the Austrian economists which both argue that the central bank should be abolished. However, there is also a sharp distinction between the two branches regarding the fractional reserve banking system.

### 7.2.1 100 Percent Reserve Gold Standard

Throughout our analysis of the ABCT, we assumed that the central bank was solely responsible for the credit expansion and the supposedly inevitable consequences. However, according to the Austrians who advocate a 100 percent reserve gold standard (such as Huerta de Soto and Rothbard), it is not simply central banking per se, but the phenomenon of fractional reserve banking that cause business cycles. Fractional reserve banking is the currently dominating banking principle, in which banks are only required to maintain a specified fraction of their deposit as reserves while the remainder may be lent out. The supporters of a 100 percent reserve gold standard have two main arguments against the fractional reserve system: It is seen as unethical and inflationary.

The ethical argument is based on the difference between irregular deposit contracts and loan contracts. As Huerta de Soto explains, on the one hand,

the aim of the loan contract is precisely to cede today the availability of present goods to the borrower for his use, in order to obtain in the future a generally larger quantity of goods in exchange at the end of the term set in the contract (Huerta de Soto, 2006:15).

The irregular deposit, on the other hand, “is not a credit transaction, because the essential element, the exchange of present goods for future goods, is absent” (Huerta de Soto, 2006:14). In other words, a loan contract implies in essence that the lender gives up his property right for the duration of the loan, enabling the borrower (the bank) to invest or lend the money to third parties at an interest. By contrast, the lender that signs the irregular deposit contract seeks merely a “warehouse” in which to store his money. In this case, the lender may claim his money at any time, and the borrower (the bank/warehouse) has no right to lend the money out to a third party. What is the problem here? According to supporters of a 100 percent reserve gold standard, the fractional reserve system gives the banks an incentive to equate the two types of contracts, because excess profits may be gained by lending out the deposits many times, such as is legal under the fractional reserve system. However, as is claimed by Huerta de Soto (2006:136-137), while many depositors lend money to the bank under the impression that their property will be available at any time, the banks accept the deposits only with the intention of keeping a fraction of it as reserves. As Rothbard states, “The banks here [...act like] an embezzler when he takes money out of the company till to invest in some ventures of his own. Like the banker, he sees an opportunity to earn a profit on *someone else's* assets” (Rothbard, 2005[1962]:19).



More important for our case however, is the claim that the fractional reserve system is inflationary. According to Huerta de Soto, when a lender deposits 1,000,000 monetary units (m.u.) in the bank, he thinks that he has this amount of money at his disposal. However, if we assume that the reserve ratio is 0.1, the bank is at the same time able to lend out 900,000 m.u. Hence, two different agents have a claim to the money, so that the subjective amount of money in the economy has increased to 1,900,000 monetary units (2006:186). As Huerta de Soto goes on to explain, the amount of money created unsupported by savings increase both in substance and in complexity if we were to consider the case of many banks interacting in the economy. He concludes that

If all banks simultaneously receive new deposits of money, they will be able to expand credit without having to decrease their cash reserves, because although they grant loans which could lead to a withdrawal of cash, they simultaneously receive the deposit of a portion of the money loaned by other banks. Hence, in practice, significant decreases in each bank's reserves will not necessarily occur, and each bank, while maintaining its reserves practically intact, will be able to make loans and therefore create deposits without serious risk (Huerta de Soto, 2006:231-232).

Thus, according to this view, the problem of the business cycle is not solely created by the central bank, but rather by “cheap credit”, i.e. credit which is unsupported by saving. However, Rothbard claims that the introduction of central banks eased the free-market restrictions on fractional reserve banking in several ways (Rothbard, 1994:62). Firstly, the central bank has become a “lender of last resort”, which can bail banks out in cases where bank deposits are reclaimed to such an extent that banks are rendered insolvent. Clearly, this may distort incentives and cause a moral hazard problem. Secondly, before the existence of central banks, the market put a limit to the extent of which individual banks could reduce their bullion reserves (gold, silver) by expanding notes or deposits. If the reserves of any single bank were too low, the claims from other banks would soon render the expanding bank insolvent. By contrast, in the modern world of central banks and a monopoly of bank notes, no such limits need to hold the banks back. The reason, Rothbard claims, is that all the banks may now expand together and in proportion to each, because the central bank may function as a “cartelizing agent” (Rothbard, 1994:63-64).

Due to the fact that the fractional reserve system and the central bank supposedly are responsible for the business cycle, many Austrian economists advocate a 100 percent reserve gold standard. Arguably, this position is one of the reasons why Austrian economics is thought to be naïve by many economists. Although it is widely conceived that the classical

gold standard (ca 1880-1914) was remarkably stable and successful (Bloomfield, 1959:9,21), the attempts to reestablish convertibility of the major currencies into gold ultimately failed both after the First and the Second World War. In response to this claim, the Austrians maintain that the gold standards that were established following the two wars were only parodies of a true gold standard. More important for our purpose, however, is not the debate over the interwar gold exchange system, but rather why the Austrians uphold the gold standard as a preferable system. In other words, why should a supply of money determined by gold production necessarily equalize the natural rate of interest with the market rate of interest?

According to Mises, this will not be the case. “In a living and changing world”, he maintains, “there can be no such thing as stability of purchasing power” (Mises, 1998:470-471). To Austrians, the virtue of the gold standard is rather that it disconnects the money supply from political doctrines, pressure and human misjudgment (Mises, 1998:471). Under a 100% reserve gold standard, prices would instead be moved by two opposing forces. On the one hand, the increased supply of the commodity money would push prices up due to gold and silver production. On the other hand, the increasing money demand caused by population growth and increased productivity would push prices down, increasing the purchasing power of every monetary unit. Would not this deflation be damaging to the economy? At this point, we need to recall the Austrian jargon regarding inflation and deflation. A deflation cannot simply be referred to as a decrease in prices, as this conceals the various causes that may cause this. While Austrians regard a deflation caused by a deliberate contraction of the money supply to be harmful, this is not the case when the lower prices are caused by real factors such as improvements in technology. Rather, a decrease in prices for such reasons is thought to be beneficial to most citizens, since their real income would be increased through the continual reduction in the prices of consumer goods and services and relative constancy in nominal income (Huerta de Soto, 2006:719).

### **7.2.2 The Theory of Free Banking**

At the time of the Austrian revival in 1974, the 100% reserve gold standard position of Rothbard was adopted by practically all Austrians. However, in the following years, younger Austrians began to rethink the position which materialized into White (1984) and Selgin’s (1988) work. For the sake of brevity, I have chosen not to analyze the various objections and responses that may be made when the theoretical and practical establishment of a gold standard is considered. However, the free banking-fractional reserve objection to the gold

standard position is a result of some of these controversies. Free bankers argue that a gold standard is inflexible in that the money supply is simply determined by changes in the production of gold. This means that adjustments under the gold standard will take place through costly changes in prices, rather than through changes in the nominal quantity of money. Clearly, this may be a high price to pay in order to get rid of the centralized determination of the money supply (Horwitz, 2000:227). Disadvantages such as these are the reason why the 100% reserve suggestion has been abandoned by many Austrians, in exchange for a fractional reserve free banking system.

The theory of free banking acknowledges the potential problems of a money supply controlled by the central bank, but argues that the fractional reserve system should be maintained in order to provide flexibility to the economic system at a low cost. Similarly, free banking theorists argue that a free banking system can avoid the dilemma between rules and discretion, which is associated with central banking. In particular, Horwitz states that,

free banking would combine the flexibility provided by discretion with the boundaries (particularly the division of money production and the seigniorage interests of the government) intended to be provided by a monetary rule. Unlike discretionary central banks, free banks would not adjust the money supply in any way they see fit, while waiting months until the effects of such changes appear in macroeconomic aggregates. Rather, the decisions individual banks would make about how much money to supply would be based on microeconomic considerations (Horwitz, 2000:210).

How would such a free banking system work in practice? The point of the theory is that the determination of the money supply is left to the market place and the forces of supply and demand. In this system, banks are treated no different from other corporate entities, and they have the ability to supply the customers with currency backed by a form of reserves. This reserve medium, according to Horwitz, could be a commodity such as gold, or it could be a market basket of goods or a frozen stock of Federal Reserve notes. What is important is that the currency is a liability of the individual bank and that the bank needs to hold reserves against it (Horwitz, 2000:210). In this system then, the free banks would themselves determine the appropriate level of reserves. The main virtue of the system would be the trade-off in this reserve holding decision. On the one hand, a low reserve ratio would be accompanied by a liquidity risk. If many customers were to redeem their reserves within a short period of time, the bank could go bankrupt. On the other hand, a high reserve ratio would mean that the bank was failing to obtain profitable interest associated with lending. In this way, the market would ensure that the banks always produced enough deposits and

currency to satisfy the public's demand to hold these liabilities. By keeping track of the bank's reserve ratio, the bankers can at any time determine whether the bank is risking a liquidity crisis (if the ratio is too low) or if the bank is missing out on profitable opportunities (if the ratio is too high) (Horwitz, 2000:211).

In the free banking system, it is argued, the monetary disequilibria can be equalized quickly through changes in the nominal supply of money. Thus, the incentives of profit and loss on part of the bankers will ensure that the market rate of interest will never deviate much from the natural rate. By contrast, even if the central bank attempt to maintain monetary equilibrium, it has neither the ability to react as quickly as the private banks nor the market incentives to do so. While the central bank responds to aggregate information through several lags, the changes in the money supply under a free banking system would be provided quickly by reliance on the invisible hand (Horwitz, 2000:211).

In these ways, the free banking system aims at improving the flexibility of the current central banking system, while at the same time removing the decision making from the centralized government, as is the point of the 100% reserve gold standard. The implication of both of these Austrian suggestions is of course that a very small role (if any) is left for monetary policy-making. To Austrians, this is seen as the main objective of the construction of a monetary regime, an aim that stands in stark contrast to the fact that monetary policy is seen by the vast majority of the economics profession as one of the most important and useful tools of economic policy. For Austrians, the disregard for monetary policy is obviously due to the central bank's lack of ability when it comes to maintaining monetary equilibrium and, hence, the responsibility for the Austrian business cycle. Thus, if Austrians hope to ever change the monetary policy debate from one of rules versus discretion, in exchange for a debate of central banking versus free banking, the ABCT should first be developed in a way that convinces the mainstream of the validity of the business cycle theory we have examined.

### ***7.3 A Summary: The Third Question***

Based on the preceding exposition and critique of the Austrian Business Cycle Theory, it is time to sum up by attempting to answer the third question that was stated in the introduction: To what extent can the ABCT be said to be a valid theory? The validity of the ABCT may be evaluated in two ways. First, we may ask to what extent the model is consistent with the data and, second, we can investigate to what extent the logical deductions of the theory are

doubtful. Neither of these ways can of course completely determine the validity of the ABCT, but they can bring us closer to the truth.

This thesis has been a theoretical one and the empirical investigation was restricted to a modest verbal analysis of time series. Although these seemed to fit the theory well, more advanced econometric analysis are clearly necessary to say something more about these matters. Such empirical tests of the ABCT are few, but have increased in number during the previous years. The conclusions of these examinations have to some extent been in favor of the ABCT<sup>16</sup>.

As one among many monetary theories, the ABCT seems to be on safe empirical grounds. As Romer states, “there is strong evidence that monetary shocks have important real effects” (Romer, 2006:213). The current economic downturn seems to add further evidence to this claim, as the financial crisis hardly can be explained solely by for example technological shocks. Thus, as the Austrians argue, money matters and changes in the money supply can cause real disturbances even if the actors are assumed to be rational. Other parts of the ABCT that are not shared by competing theories are less readily tested. E.g. money is seen as a cause of distortions in the capital structure, distortions that are necessarily long-lasting and in need of liquidation since capital goods are heterogeneous and thus costly to put to a different use. However, as already discussed, this capital theory is certainly questionable in itself. And even if the Hayekian triangle were to be tested as it is, the common macroeconomic variables will to a large extent be inadequate for this purpose.

Hence, since it is unclear how to test the capital theory empirically, which is such an essential part of the ABCT, it is problematic to draw any stark conclusions about validity based exclusively on data. This indicates that the capital theory should be developed in a way that could more readily be evaluated by statistical methods. For example, if it could be shown that some sectors or stages of the economy are more sensitive to changes in the rate of interest than others, this would be a clear improvement compared to the unclear references to “earlier” and “later” stages of production. However, such a theory would necessarily have to be built on empirical investigations in order to reveal which parts of the economy are more sensitive to changes in the interest rate. Given the methodological philosophy of the Austrian School, work in this direction is unlikely to take place.

The logic of the ABCT may be, and has indeed been, questioned on many accounts. The capital theory has already been mentioned as problematic, along with the market for

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<sup>16</sup> E.g. (Bismans & Mougeot, 2009), (Butos, 1993) and (Mulligan, 2006).

loanable funds and the Austrian methodology. These are the main explanations why the ABCT has been criticized and completely rejected by the mainstream and this is not likely to change. Thus, there seems to be several potentially problematic questions and this prevents us from concluding unambiguously that the ABCT is a logically consistent and valid theory.

However, logical inconsistency will not necessarily dismiss the theory. A review of section 3.3 reminds us of Friedman's claim

the relevant question to ask about the "assumptions" of a theory is not whether they are descriptively "realistic," for they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only by seeing whether the theory works, which means whether it yields sufficiently accurate predictions (Friedman 1966: 15).

If we accept this statement, the ABCT should not be rejected by the mainstream based on its assumptions and logical consistency, but only by empirical tests. Hence, an answer to the third question can more readily be given by an empirical examinations than from this theoretical exposition.

Should a rejection of the ABCT imply that the theory ought to be referred exclusively to economic history? Not necessarily, and I will end by giving three reasons for this. First, whether one considers a theory to be logically correct or not is not independent of methodological philosophy. During my parallel study of the Austrian School and conventional economics it has occurred to me that the entire starting point and framework in which the studies are conducted is different. A theory may certainly be considered logically consistent in one framework and inconsistent in another. Secondly, the ABCT brings several interesting issues to the forefront that may have useful implications for mainstream macroeconomic theory. As examples we may here again mention the focus on capital theory, in what way an increase in the money supply enters the economy and the view of inflation as an increase in the supply of money rather than an increase in the general price level. Although these thoughts are not revolutionary, they are examples of ideas with potential value to the mainstream approach. Thirdly, in the spirit of which this thesis is written, I hope the reader has found reasons to agree with my introductory remark regarding the utility of studying alternative approaches. The Austrian business cycle theory may well serve a useful purpose in this sense and has undoubtedly done so for this writer.

## 8.0 Conclusion

The central point of the theory of the Austrian business cycle is easy to state and to grasp: an artificial expansion of credit makes entrepreneurs misallocate investments during the boom so that the capital structure is disrupted. These malinvestments are at odds with consumer preferences and must be liquidated in order to release resource that should be put to better use. Since capital goods are specific, this change cannot happen immediately or costlessly. Nevertheless, a postponement of the process by further injections of credit will only aggravate the bust that nonetheless will happen sooner or later.

In this master's thesis I have attempted to analyze this theory in detail with the aim of providing answers to three introductory questions. In the following, I shall recapitulate the suggested answers.

1. What is the Austrian explanation for, and solution to, the ongoing 2008 financial crisis?

There are several Austrian explanations for the current economic downturn, but the main cause, which is also most in accordance with the theory examined, is that the American central bank caused the downturn by expanding credit in the years preceding the crisis. This lead to overconsumption, overinvestment and, most importantly, malinvestment. Although Austrians would argue that resources have been malinvested in general, there also seems to have been a specific malinvestment into the housing sector. According to the theory, the credit expansion could not go on forever since the market rate of interest cannot deviate from the natural rate for a long time. Hence, the credit contraction and, subsequently, the crisis had to come about. The data examined in this thesis supports this theory, but, as already emphasized, more advanced statistical methods are necessary in order to determine the explanatory power of the ABCT and the economic downturn of 2008.

Austrians are critical to the monetary and financial policies that have been chosen to counter the downturn. The reason is that resources are seen to be malinvested, meaning that some businesses are producing goods that would not have been profitable if it was not for the artificial expansion of credit. These companies should reduce their activity, or even go bankrupt, in order to release resources so that the production of more intensely demanded goods may be launched instead. In the Austrian view, the liquidation of these resources would have lead to a downturn, but the economists of this school of thought argue that the least

damaging decision would have been to let the consequences come about. The reason is that efforts to prevent a downturn that has been caused by a monetary expansion, will only aggravate and delay the recession that will have to take place sooner or later. Thus, economists who accept the propositions of the Austrian business cycle theory argue that the low rates of interest and the credit expansions that have taken place all over the world will prove to be an unwise policy in the future.

## 2. What are the policy implications of the Austrian business cycle theory?

Modern Austrian economists who adhere to the theory argue that monetary equilibrium must be maintained. Since they claim that the central bank is unfit for the job of keeping the market rate of interest equal to the natural rate, Austrians generally argue for abolishing the central bank in order to prevent a credit expansion that would lead to the business cycle. Furthermore, there is disagreement within the Austrian camp as to whether the fractional reserve system should be abolished as well. The most radical branch, arguing for a 100 percent reserve gold standard, claim that the fractional reserve system is fraudulent and inflationary. Other Austrians reject the suggestion of a money supply determined by gold, but argue instead that the supply of money should be determined by the market place in a free banking system. Obviously, both of these suggestions are quite radical, as most monetary policy debates do not even consider the abolition of central banks, but rather revolve around the question of how the policy of central banks should be conducted.

## 3. To what extent can the Austrian business cycle theory be said to be a valid theory?

This question can not readily be answered based on the present work. As was argued in section 7.3, there are logical problems with the Austrian business cycle theory, for example the fact that the capital structure of the economy is seen as consisting of stages of production, even though these stages clearly intersect and cannot be separated. This makes it difficult to explain, and to test, how the capital structure is being affected. Nevertheless, according to the dominant economic methodology, the validity of theories should be determined based on the theory's prediction performance. Although the data examined in this work are promising for the validity of the theory, a humble interpretation of graphs is hardly convincing. Clearly, more advanced empirical work is necessary in order to determine to what extent the ABCT in fact tells us something about the macro economy of the real world.



## Bibliography

- Barnett II, W., & Block, W. (2006b). On Hayekian Triangles. *Procesos De Mercado: Revista Europea De Economia Política* , 3 (2), 39-141.
- Barnett II, W., & Block, W. (2006a). Tyler Cowen on Austrian Business Cycle Theory: A Critique. *New Perspectives on Political Economy* , 2 (2), 26-85.
- Batemarco, R. (1994). Austrian business cycle theory. In T. E. Economics, *The Elgar Companion to Austrian Economics* (pp. 216-223). Hants, England: Edward Elgar.
- Bismans, F., & Mougeot, C. (2009). Austrian business cycle theory: Empirical evidence. *The Review of Austrian Economics* , 22 (3), 241-257.
- Blachard, O. (2003). *Macroeconomics*. New Jersey: Prentice Hall.
- Blaug, M. (1980). *The Methodology of Economics*. New York: Cambridge.
- Block, W. (2001). Yes, We Have No Chaff: A Reply to Wagner's "Austrian Cycle Theory: Saving the Wheat While Discarding the Chaff". *The Quarterly Journal of Austrian Economics* , 4 (1), 63-73.
- Bloomfield, A. (1959). *Monetary policy under the international gold standard, 1880-1914*. New York: Federal Reserve Bank of New York.
- Boettke, P. &. (2003). The Austrian School of Economics: 1950-2000. In W. Samuels, J. Biddle, & J. (. & Davis, *A Companion to the History of Economic Thought* (pp. 445-453). Oxford: Blackwell Publishing Ltd.
- Boettke, P. (2007, December 2007). Boettke on Austrian Economics (Econtalk-Podcast). (R. Roberts, Interviewer)
- Boettke, P. (1996). What is Wrong with Neoclassical Economics (And What is Still Wrong with Austrian Economics)? In F. Foldvary, *Beyond Neoclassical Economics* (pp. 22-40). Aldershot, UK: Edward Elgar Publishing.
- Butos, W. (2001). Garrison and the "Keynes Problem". *The Quarterly Journal of Austrian Economics* , 4 (3), 5-16.
- Butos, W. (1993). The recession and Austrian business cycle theory: An empirical perspective. *Critical Review: A Journal of Politics and Society* , 7 (2), 277-306.
- Böhm-Bawerk, E. (1959[1884,1889,1912]). *Capital and Interest*. South Holland, Illinois: Libertarian Press.
- Böhm-Bawerk, E. (1891). The Austrian Economists. *Annals of the American Academy of Political and Social Science*, 1.
- Callahan, G., & Garrison, R. (2003). Does Austrian Business Cycle Theory Help Explain the Dot-Com Boom and Bust? *The Quarterly Journal of Austrian Economics* , 6 (2), 67-98.
- Caplan, B. (2008, January 2). *What's Wrong With Austrian Business Cycle Theory*. Retrieved August 23, 2009, from Library of Economics and Liberty: [http://econlog.econlib.org/archives/2008/01/whats\\_wrong\\_wit\\_6.html](http://econlog.econlib.org/archives/2008/01/whats_wrong_wit_6.html)
- Caplan, B. (1997). *Why I Am Not an Austrian Economist*. Retrieved August 21, 2009, from George Mason University: <http://economics.gmu.edu/bcaplan/whyaust.htm>
- Cochran, J. C. (2003). Austrian Business Cycle Theory: Variations on a Theme. *The Quarterly Journal of Austrian Economics* , 6 (1), 67-73.
- Cowen, T. (1997). *Risk and Business Cycles*. London: Routledge.
- Ebeling, R. (1990). Introduction. In L. v. Mises, *Money, Method, and the Market Process - Essays by Ludwig von Mises* (p. xi). Dordrecht, The Netherlands: Kluwer Academic Publishers Group.

- Festré, A. (2006). Knut Wicksell and Ludwig von Mises on Money, Interest and Price Dynamics. *Journal of the History of Economic Thought* , 28 (3), 333/357.
- Fillieule, R. (2007). A Formal Model in Hayekian Macroeconomics: The Proportional Goods-in-Process Structure of Production. *The Quarterly Journal of Austrian Economics* , 10, 193-208.
- Formaini, R. (2004). Knut Wicksell: The Birth of Modern Monetary Policy. *Economic Insights - Federal Reserve Bank of Dallas* , 9 (1).
- Friedman, M. (1993). The "Plucking Model" of Business Fluctuations Revisited. *Economic Inquiry* , 31 (2), 171-177.
- Friedman, M. (1966[1953]). The Methodology of Positive Economics. In M. Friedman, *Essays In Positive Economics* (pp. 3-16, 30-43). Chicago: University of Chicago Press.
- Garrison, R. (2009, May). Mainstream Macro in an Austrian Nutshell. *The Freeman* , 59 (4), pp. 10-17.
- Garrison, R. (2004). Overconsumption and Forced Saving in the Mises-Hayek Theory of the Business Cycle. *History of Political Economy* , 36 (2), 323-349.
- Garrison, R. (2001). *Time and Money - The Macroeconomics of Capital Structure*. London: Routledge.
- Gordon, D. (1996). *The Philosophical Origins of Austrian Economics*. Retrieved August 21, 2009, from Ludwig von Mises Institute: <http://mises.org/pdf/philorig.pdf>
- Hayek, F. (2007[1976]). *Choice in Currency - A Way to Stop Inflation*. London: The Institute of Economic Affairs.
- Hayek, F. (1937). Investment that Raises the Demand for Capital. *Review of Economics and Statistics* , 19 (4), 174-177.
- Hayek, F. (2008[1931]). Prices and Production. In F. Hayek, *Price & Production and Other Works* (pp. 189-330). Auburn, Alabama: Ludwig von Mises Institute.
- Hayek, F. (1992[1968]). The Austrian School of Economics. In F. Hayek, & P. G. Klein (Ed.), *The Fortunes of Liberalism: Essays on Austrian Economics and the Ideal of Freedom. Vol. 4 of The Collected Works of F A. Hayek*. (pp. 42-60). Chicago: University of Chicago Press.
- Hayek, F. (1950[1941]). *The Pure Theory of Capital*. London: Routledge & Kegan Paul Ltd.
- Hazlitt, H. (1984, Spring). An Interview with Henry Hazlitt. (T. A. Newsletter, Interviewer)
- Hoff, T. (1949[1938]). *Economic Calculation in the Socialist Society*. London, Edinburgh, Glasgow: William Hodge and Company Limited.
- Horwitz, S. (2000). *Microfoundations and Macroeconomics: An Austrian Approach*. London: Routledge.
- Huerta de Soto, J. (2006). *Money, Bank Credit and Economic Cycles*. Auburn, Alabama: Ludwig von Mises Institute.
- Hummel, J. (1979). Problems with Austrian Business Cycle Theory. *Reason Papers* (5), 41-53.
- Hülsmann, J. (2003). Introduction. In L. Mises, *Epistemological Problems of Economics* (pp. ix-iv). Auburn, Alabama: Ludwig von Mises Institute.
- Kaldor, N. (1939). Capital Intensity and the Trade Cycle. *Economica* , 6 (21), 40-66.
- Karlsson, S. (2008, December 31). *Yes, Greenspan Did It*. Retrieved August 23, 2009, from Ludwig von Mises Institute: <http://mises.org/story/3244>

- Keeler, J. (2001, November 17). *Relative Prices and The Business Cycle*. Retrieved August 23, 2009, from Ludwig von Mises Institute: <http://mises.org/journals/scholar/Keeler.pdf>
- Keynes, J. (1930). *A Treatise on Money*. London: Macmillan.
- Keynes, J. (1936). *The General Theory of Employment, Interest and Money*. New York: Harcourt, Brace & World.
- Keynes, J. (1931). The Pure Theory of Money. A Reply to Dr. Hayek. *Economica* (34), 387-397.
- Kilborne, P. (1988, July 23). 'Fresh Water' Economists Gain. *The New York Times*, pp. 35, Section 1.
- Kirzner, I. (1997, Spring). Between Mises and Keynes - An Interview with Israel M. Kirzner. (T. A. Newsletter, Interviewer)
- Kirzner, I. (1973). *Competition and Entrepreneurship*. Chicago and London: The University of Chicago Press.
- Kirzner, I. (1996). *Essays on Capital and Interest - An Austrian Perspective*. Cheltenham, UK & Brookfield, US: Edward Elgar.
- Klein, P. G. (2008). The Mundane Economics of the Austrian School. *The Quarterly Journal of Austrian Economics*, 11 (3-4), 165-187.
- Kling, A. (2003, November 11). *TCSDaily*. Retrieved August 21, 2009, from The Sect of Austrian Economics: <http://www.techcentralstation.com/article.aspx?id=111103C>
- Krugman, P. (2008, December 27). *The Conscience of a Liberal - Hangover Theorists*. Retrieved August 23, 2009, from The New York Times: <http://krugman.blogs.nytimes.com/2008/12/27/hangover-theorists/>
- Krugman, P. (2009, February 23). *The Conscience of a Liberal: Liquidity preference versus loanable funds, televised (wonkish, with video)*. Retrieved August 22, 2009, from The New York Times: <http://krugman.blogs.nytimes.com/2009/02/23/liquidity-preference-versus-loanable-funds-televised-wonkish-with-video/#more-1451>
- Krugman, P. (1998, December 4). *The Hangover Theory - Are recessions the inevitable payback for good times?* Retrieved August 21, 2009, from Slate Magazine: <http://www.slate.com/id/9593/>
- Lachmann, L. (1978). *Capital and its Structure*. Kansas City, Missouri: Sheed Andrews and McMeel, Inc.
- Long, R. (2006). Realism and Abstraction in Economics: Aristotle and Mises versus Friedman. *The Quarterly Journal of Austrian Economics*, 9 (3), 3-23.
- Maclean, G. (1994). Still Trying to Understand Positive Economics. *History of Economics Review*, 21, 124-129.
- Mankiw, N. G. (2006). The Macroeconomist as Scientist and Engineer. *Journal of Economic Perspectives*, 20 (4, Fall), 29-46.
- Menger, C. (2007[1871]). *Principles of Economics*. Auburn, Alabama: Ludwig von Mises Institute.
- Mises, L. (1990[1920]). *Economic Calculation in the Socialist Commonwealth*. Auburn, Alabama: Ludwig von Mises Institute.
- Mises, L. (2003[1933]). *Epistemological Problems of Economics*. Auburn, Alabama: Ludwig von Mises Institute.
- Mises, L. (1998[1949]). *Human Action - A Treatise on Economics*. Auburn, Alabama: Ludwig von Mises Institute.

- Mises, L. (2006[1928]). Monetary Stabilization and Cyclical Policy. In L. Mises, *The Causes of the Economics Crisis - and Other Essays Before and After the Great Depression* (pp. 53-154). Auburn, Alabama: Ludwig von Mises Institute.
- Mises, L. (1951[1922]). *Socialism - An Economic and Sociological Analysis*. New Haven, Connecticut: Yale University Press.
- Mises, L. (1969). *The Historical Setting of the Austrian School of Economics*. New York: Arlington House Publishers.
- Mises, L. (1953[1912]). *The Theory of Money and Credit*. New Haven, Connecticut: Yale University Press.
- Mulligan, R. (2006). An Empirical Examination of Austrian Business Cycle Theory. *The Quarterly Journal of Austrian Economics* , 9 (2), 69-93.
- Murphy, R. (2008, April 14). *Did the Fed Cause the Housing Bubble?* Retrieved August 23, 2009, from Ludwig von Mises Institute: <http://mises.org/story/2936#note1>
- Murphy, R. (2009, March 2). *Nothing Paradoxical About Thrift*. Retrieved August 30, 2009, from The Library of Economics and Liberty: <http://www.econlib.org/library/Columns/y2009/Murphythrift.html>
- Murphy, R. (2003, January 24). *The Reswitching Question*. Retrieved August 26, 2009, from Ludwig von Mises Institute: <http://mises.org/story/1148>
- Nozick, R. (1977). On Austrian Methodology. *Synthese* , 36, 353-392.
- Robbins, L. (1945). *An Essay on the Nature and Significance of Economic Science* (2nd Edition ed.). London: Macmillan and co., Limited.
- Rockwell, J. L. (1992, March 12). *Why Austrian Economics Matters*. Retrieved August 21, 2009, from The Heritage Foundation: <http://www.heritage.org/research/economy/hl368.cfm>
- Romer, D. (2006). *Advanced Macroeconomics*. New York: McGraw-Hill/Irwin.
- Rothbard, M. (2000[1963]). *America's Great Depression*. Auburn, Alabama: Ludwig von Mises Institute.
- Rothbard, M. (1957). In Defense of "Extreme Apriorism". *Southern Economic Journal* , 23 (3), 314-320.
- Rothbard, M. (2004[1962]). *Man, Economy and State with Power and Market*. Auburn, Alabama: Ludwig von Mises Institute.
- Rothbard, M. (1976). Praxeology: The Methodology of Austrian Economics. In E. G. Dolan (Ed.), *The Foundations of Modern Austrian Economics* (pp. 19-39). Kansas City, Missouri: Sheed & Ward, Inc.
- Rothbard, M. (1994). *The Case Against the Fed*. Auburn, Alabama: Ludwig von Mises Institute.
- Rothbard, M. (2005[1962]). *The Case for a 100 Percent Gold Standard*. Auburn, Alabama: Ludwig von Mises Institute.
- Salerno, J. (2008). Introduction. In F. Hayek, *Prices & Production and Other Works* (pp. xv-xxiv). Auburn, Alabama: Ludwig von Mises Institute.
- Salerno, J. (2009, August 7). *Modern Austrian History: A Response to Pete (Part 1)*. Retrieved August 28, 2009, from Ludwig von Mises Institute - Mises Economics Blog: <http://blog.mises.org/archives/010424.asp>
- Salerno, J. (1999). The place of Mises's Human Action in the development of economic thought. *The Quarterly Journal of Austrian Economics* , 2 (1), 35-65.
- Salerno, J. (2002). The Rebirth of Austrian Economics - In Light of Austrian Economics. *The Quarterly Journal of Austrian Economics* , 5 (4), 111-128.

- Samuelson, P. (1966). A Summing Up. *The Quarterly Journal of Economics* , 80 (4), 568-583.
- Sandmo, A. (2006). *Samfunnsøkonomi - en idéhistorie (In Norwegian)*. Oslo: Universitetsforlaget.
- Selgin, G. (1988). Praxeology and understanding: An analysis of the controversy in Austrian economics. *Review of Austrian Economics* , 2, 19-58.
- Selgin, G. (1988). *The Theory of Free Banking: Money Supply under Competitive Note Issue* . Totowa, NJ: Roman and Littlefield.
- Shostak, F. (2009, March 19). *The Fed Did It, and Greenspan Should Admit It*. Retrieved August 23, 2009, from Ludwig von Mises Institute: <http://mises.org/story/3382>
- Skousen, M. (2001). *The making of modern economics: the lives and ideas of the great thinkers*. Armonk, New York: M.E. Sharpe, Inc.
- Sraffa, P. (1932). Dr. Hayek on Money and Capital. *The Economic Journal* , 42 (165), 42-53.
- Sraffa, P. (1960). *Production of Commodities by Means of Commodities: Prelude to a Critique of Economic Theory*. Cambridge: Cambridge University Press.
- Sørensen, P. &.-J. (2005). *Introducing Advanced Macroeconomics: Growth & Business Cycles*. New York: McGraw-Hill Education.
- Taylor, T. (1990). *An Introduction to Austrian Economics*. Retrieved August 22, 2009, from Ludwig von Mises Institute: <http://mises.org/books/introtoaustrian.pdf>
- Tullock, G. (1988). Reply to comment by Joseph T. Salerno. *Review of Austrian Economics* , 3, 147-149.
- Tullock, G. (1987). Why Austrians Are Wrong About Depressions. *The Review of Austrian Economics* , 2, 73-78.
- Wagner, R. (2005). Austrian Cycle Theory and the Prospect of a Coordinationist Macroeconomics. In J. Backhaus, *Modern Applications of Austrian Thought* (pp. 77-92). London: Routledge.
- Wagner, R. (1999). Austrian Cycle Theory: Saving the Wheat while Discarding the Chaff. *Review of Austrian Economics* , 12, 65-80.
- Weintraub, E. (1993). *Library of Economics and Liberty*. Retrieved August 21, 2009, from "Neoclassical Economics", The Concise Encyclopedia of Economics: <http://www.econlib.org/library/Enc1/NeoclassicalEconomics.html>
- White, L. (1984). *Free Banking in Britain: Theory, Experience and Debate, 1800-1845*. London and New York: Cambridge University Press.
- White, L. (2003). *The Methodology of the Austrian School Economists*. Retrieved August 22, 2009, from Ludwig von Mises Institute: <http://mises.org/pdf/methfinb.pdf>
- Wicksell, K. (1962[1898]). *Interest and Prices*. New York: Sentry Press.
- Younkins, E. (2005). Carl Menger's Austrian Aristotelianism. In E. Younkins (Ed.), *Philosophers of Capitalism: Menger, Mises, Rand and Beyond* (pp. 15-48). Oxford: Lexington books.